DOCUMENT RESUME

ED 435 929 CG 029 630

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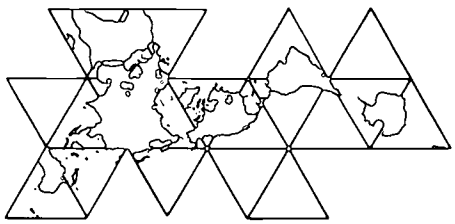
TITLE Life-Paths into Young Adulthood and the Course of Substance Use and Well-Being: Inter- and Intra-Cohort Comparisons. Monitoring the Future Occasional Paper No. 43.

INSTITUTION Michigan Univ., Ann Arbor. Inst. for Social Research.
SPONS AGENCY National Inst. on Drug Abuse (DHHS/PHS), Rockville, MD.
PUB DATE 1998-00-00
NOTE 91p.; Paper based in part on a presentation to the International Conference on Negotiating Adolescence in Times of Social Change: Concepts and Research (State College, PA, March 1996).
CONTRACT NIDA-DA01411
PUB TYPE Reports - Research (143)
EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Cohort Analysis; Drinking; *High School Seniors; High Schools; Marijuana; Sex Differences; Smoking; *Well Being; *Young Adults
IDENTIFIERS Monitoring the Future; *Transition Management

ABSTRACT

Moving from high school into young adulthood is a critical developmental transition, a time of both continuity and discontinuity in health and well-being. How well one negotiates this transition, as evidenced by one's course of well-being and substance use, depends in part on historical cohort, gender, and life-path. Using U.S. national panel data from 17 consecutive cohorts from the Monitoring the Future study, this paper examines age-related change in well-being and substance use during the first four years following high school. It examines whether the changes varied as a function of cohort group, gender, and life-path group. Findings show that well-being and substance use increased during the transition to young adulthood. Although there were no overall differences in well-being among the three cohort groups, findings show that the course of self-efficacy and fatalism during the transition differed somewhat among the cohorts. Men reported higher levels of well-being and substance use, except for cigarettes, than women. Overall differences in well-being and substance use were found across the life-paths. Limitations of the study and future directions for research are also discussed. (Contains 9 tables, 21 figures, and 68 references.) (MKA)



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LIFE-PATHS INTO YOUNG ADULTHOOD AND THE COURSE OF SUBSTANCE USE AND WELL- BEING: INTER- AND INTRA-COHORT COMPARISONS

John Schulenberg
Patrick M. O'Malley
Jerald G. Bachman
Lloyd D. Johnson

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As its title suggests, this study is intended to assess the changing lifestyles, values, and preferences of American youth on a continuing basis. Each year since 1975 about 17,000 seniors have participated in the annual survey, which is conducted in some 130 high schools nationwide. In addition, subsamples of seniors from previously participating classes receive follow-up questionnaires by mail each year.

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Institute for Social Research
The University of Michigan
1998

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AUTHORS' NOTE

This is part of a larger study funded by a grant from the National Institute on Drug Abuse (DA01411). This occasional paper is an expanded version of a chapter by the same authors that will appear in L.J. Crockett and R.K. Silbereisen (Editors), *Negotiating adolescence in times of social change* (New York: Cambridge University Press). It is based in part on an invited presentation by the first author to the International Conference on Negotiating Adolescence in Times of Social Change: Concepts and Research, Pennsylvania State University, March 1996, sponsored by the Pennsylvania State University, USA, and the Friedrich Schiller University of Jena, Germany. We thank Lisa Crockett, Rainer Silbereisen, and an anonymous reviewer for helpful feedback on previous drafts, as well as Joyce Buchanan, Jonathon Brenner, Nicole Hitzemann, Jeanette Lim, and Katherine Wadsworth for assistance with data and text management and data analysis. Address correspondence to John Schulenberg, Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, MI 48106-1248.

INTRODUCTION

The period between adolescence and adulthood represents a critical developmental transition. Diversity in life paths becomes more clearly manifest during this transition (Sherrod, 1996; Sherrod, Haggerty, & Featherman, 1993), and interindividual variability in the timing and content of developmental milestones increases. This increased diversity is due to the realization of life path preferences established prior to the transition as well as to the creation of new paths as a function of experiences during the transition. The emergence of new roles and social contexts provides increased opportunities for successes and failures, which in turn may set the stage for potential discontinuity in functioning and adjustment between adolescence and young adulthood (e.g., Aseltine & Gore, 1993; Petersen, 1993; Schulenberg, Wadsworth, O'Malley, Bachman, & Johnston, 1996).

At the broader societal level, there is relatively little institutional structure to facilitate the transition to young adulthood (Hamilton, 1990; Hurrlemann, 1990). For example, there is far less institutionally- and culturally-imposed structure on the roles, experiences, and expectations of young people when they make the transition out of adolescence compared to when they make the transition into adolescence (see Table 1). This relative lack of structure is undoubtedly developmentally beneficial for some older adolescents as they make the transition into young adulthood. For others, however, the lack of structure creates a developmental mismatch that adversely influences their health and well-being (see e.g., Eccles et al., 1997; Lerner, 1982; Schulenberg, Maggs, & Hurrelmann, 1997).

Moreover, as Clausen (1991), Elder (1986), and Schuman and Scott (1989) have shown, decisions and experiences during this transition can have powerful reverberations throughout the course of one's adulthood (see also, e.g., Marini, 1987; Mortimer, 1991). Certainly, much of one's "foundation" is set and many of the initial decisions regarding future plans are made prior to leaving high school. But the actual experiences of young adulthood -- the joining of intentions and realities, the deflections of initial plans and making of new ones, the episodes of successes and failures with the various normative tasks -- set the stage for the course of one's adult life.

Life Paths into Young Adulthood and Health and Well-being

The present study was undertaken to examine the impact of these new social roles and contexts on health and well-being between the senior year of high school (age 18) and four years post-high school (age 22) using multi-cohort national panel data drawn from the Monitoring the Future study (e.g., Johnston, Bachman, & O'Malley, 1995; Bachman, Wadsworth, O'Malley, Johnston & Schulenberg, 1997). This "launching" period immediately following high school is an important one, for it is when initial plans combine with experiences to set into motion the paths that will take the young person through the transition and into adulthood (Gore, Aseltine, Colten & Lin, 1997). We build upon previous research with the Monitoring the Future data that has shown the importance of such experiences as marriage and living arrangements on post-high school substance use (e.g., Bachman, O'Malley, & Johnston, 1984; Bachman et al., 1997), and take a pattern-centered approach to focus on individual life paths defined by the combination of

individual's social roles and experiences during the transition. Specifically, individuals were placed into mutually exclusive life path groups depending on their experiences during this launching period.

This life-paths strategy, which draws from Elder's (1995, 1998) conceptualizations regarding social life course and Magnusson's (1995) pattern-centered holistic approach to studying change, rests on the assumption that decisions regarding the pursuits typical of the transition are not made independently; rather, certain pursuits (e.g., full-time education) typically make others (e.g., full-time employment) unlikely. In addition, it is assumed that certain pursuits take precedence over others in terms of impact on individual's lives. For example, the power that marriage tends to have on increasing health and well-being makes getting married during the launching period a pivotal experience that likely overshadows the impact of educational and occupational pursuits. Furthermore, individuals' experiences during this transition are structured at least to some extent by whether they remain in their parents' home (e.g., Bachman et al., 1997; Flanagan, Schulenberg, & Fuligni, 1993; Graber & Dubas, 1996).

A Needed Focus on Inter- and Intra-cohort Differences and Similarities

Research conducted in the past two decades should give scientists interested in the study of adolescence some measure of satisfaction. The sheer amount of knowledge generated has been impressive; more importantly, the quality of the research has improved. Contextually-sensitive and cross-cultural studies have become much more common, and cross-sectional studies have given way to longitudinal studies. Nevertheless, it is clear that our current scientific knowledge about adolescents is based largely upon conceptualizations and data that are culture-bound and time-bound. Indeed, the serious empirical study of adolescents is about 40 years old (which is probably less than the average age of developmental scientists who study adolescence), and only recently have we seen sustained efforts to compare adolescents from different countries and cultures. Similarly, with few exceptions (e.g., Elder, 1974; Modell, Furstenberg, & Hershberg, 1976; Nesselroade & Baltes, 1974), only during the past decade or so have there been systematic attempts to address directly basic questions about the effects of historical change on the experience of adolescence (e.g., Crockett, 1997; Elder, Modell, & Parke, 1993; Noack, Hofer, & Youniss, 1995).

A primary focus of the present study is on birth cohort differences in well-being and substance use over the past two decades, with a particular emphasis on determining whether the course of well-being and substance use during the transition to young adulthood varies as a function of cohort. While there have been some studies to suggest that the transition to young adulthood is accompanied by increased well being (e.g., Aseltine & Gore, 1993; Bachman, O'Malley, & Johnston, 1978), few such studies have included multiple cohorts. Likewise, there is an abundance of studies to suggest that substance use increases during the transition, but other than the Monitoring the Future study, few have tracked multiple cohorts (but see, e.g., Elliott, Huizinga, & Menard, 1989). Thus, the extent to which changes in well-being and substance use during the transition reflect cohort-dependent experiences that vary with social change remains an open question.

In the past two decades in the United States, macrolevel social change is probably best conceptualized as emerging fairly continuously (e.g., increased availability of personal computers, increased maternal employment, increased college attendance and age of first marriage), rather than as a function of single defining historical events (e.g., the Great Depression). This, of course, makes it difficult to isolate social change and to capture its nature and impact. Still, in terms of "youth culture," the last two decades have witnessed some important macrolevel changes. For example, during the late 1970s (when Jimmy Carter was president), conservative and materialistic values were low and altruistic values were high; this pattern was reversed during the early and middle 1980s (when Ronald Reagan was president), and then reversed again during the early 1990s (when George Bush was president) (e.g., see Schulenberg, Bachman, Johnston, & O'Malley, 1995). During these same three historical periods, there were important changes in illicit drug use among young people, with a decline in illicit drug use during the 1980s, followed by an upturn in the early 1990s (Johnston, O'Malley, & Bachman, 1998). Another important historical trend was that by the end of the 1970s, the last birth cohorts of the "baby-boom generation" had progressed through high school, with the post-baby boom cohorts (sometimes popularly referred to as "Generation X") experiencing adolescence during the 1980s when economic and demographic forces lead many to believe that career prospects would be more limited (e.g., Holtz, 1995).

Given these macro-level social changes, and given the opportunities and constraints in our data set, we focus the present study on three cohort groups: Cohort 1 consisted of those who were seniors in high school during the period of 1976 through 1981; Cohort 2 consisted of the 1982-86 senior year cohorts; and Cohort 3 consisted of the 1987-92 senior year cohorts. It is important to recognize that this emphasis on cohort groups, while appropriate given our purposes here, nevertheless serves to confound period effects (i.e., secular trends) with cohort effects and to a lesser extent with age effects.

Clearly, inter-cohort comparisons are important, but they become more important when intra-cohort comparisons are also conducted (e.g., Ryder, 1965). Social change hardly ever strikes a cohort uniformly, and intra-cohort comparisons permit us to see how pervasive the effects of social change may be, as well as to begin to understand the mechanisms that connect historical and individual change. In the present study, we focus on how cohort interacts with life paths and gender in influencing the course of well-being and substance use during the transition to young adulthood.

In summary, the present study was undertaken to examine the courses of well-being and substance use during the transition to young adulthood. We used multi-cohort U.S. national panel data spanning ages 18 to 22 to describe the courses of well-being and substance use and to determine whether the courses varied as a function of cohort, gender, and life-paths, as well as a function of interactions among cohort, gender, and life paths.

METHOD

Three waves of national panel data from 17 consecutive cohorts were obtained from the Monitoring the Future (MtF) project. MtF is an ongoing cohort-sequential longitudinal project designed to understand the epidemiology and etiology of substance use and, more broadly, psychosocial development during adolescence and young adulthood. The project has surveyed nationally representative samples of approximately 17,000 high school seniors each year in the United States since 1975, using questionnaires administered in classrooms. Approximately 2,400 individuals are randomly selected from each senior year cohort for follow-up. Follow-up surveys are conducted on a biennial basis, using mailed questionnaires. Additional details regarding the MtF project procedures and purposes are provided elsewhere (Bachman, Johnston, & O'Malley, 1996; Johnston et al., 1998; Johnston, O'Malley, Schulenberg, & Bachman, 1996).

Sample

The panel sample used in the present study consisted of 17 consecutive cohorts of respondents who were surveyed as high school seniors (Base Year or Wave 1) in 1976 through 1992, and who participated in the first two biennial follow-up surveys (Follow-Ups 1 and 2, or Waves 2 and 3, respectively). The biennial follow-up surveys begin one year post-high school for one random half of each cohort, and two years post-high school for the other half. The structure of the data set is illustrated in Figure 1. For example, as is shown, the 1976 senior year cohort had their base year (BY) survey in 1976; for one random half of this cohort, the first and second follow-ups (FU1 and FU2) occurred one and three years after high school (1977 and 1979), and for the other random half, FU1 and FU2 occurred two and four years after high school (1978 and 1980). For these analyses, the two random halves were combined to comprise two follow-up surveys with FU1 covering the first and second year out of high school (modal ages 19-20), and FU2 covering the third and fourth year (modal ages 21-22). As is shown for the 1992 senior year cohort, however, the FU2 data were not available for the second random half, and thus only the data from first random half from this cohort are included in these analyses.

The life-path analyses made it desirable to restrict the sample to respondents present at all three waves. Although retention rates for any one follow-up survey averaged 75%-80%, this more demanding restriction resulted in a sample size of 21,134 weighted cases (26,946 unweighted cases)[1] (56.5% were women), representing a retention rate of approximately 68%. Previous attrition analyses with similar MtF panel samples have shown that compared to those excluded, those retained in the panel sample were more likely to be female, white, higher on high school GPA and parental education level, and lower on high school truancy and senior year substance use (e.g., Schulenberg, Bachman, O'Malley, & Johnston, 1994; Schulenberg, Wadsworth, et al., 1996).

There were five separate questionnaire forms (six, beginning with the 1989 senior year cohort), and while the substance use measures were located on all forms, the well-being measures were located on only one form. (The different questionnaire forms are distributed randomly within schools at senior year.) In addition, the well-being measures were not included for the 1976 cohort and were not available at the time of analysis for the 1992 cohort (and where

available only for the first random half for the 1991 cohort). Thus, approximately one-fifth of the panel sample from the 1977-91 senior year cohorts was available for the well-being analyses, including 3,586 weighted (4,670 unweighted) cases.

Sub-sample Groups

Cohort groups. The senior year cohorts were arranged into three groups: Cohort 1 included the 1976-81 senior year cohorts (1977-81 for the well-being analyses); Cohort 2 included the 1982-86 senior year cohorts; and Cohort 3 included the 1987-92 senior year cohorts (1987-91 for the well-being analyses). This trichotomous grouping reflects an historically appropriate one as discussed in the Introduction.[2] Nevertheless, this strategy ignores within cohort-group period differences, an important limitation given that Cohort 1 experienced the four years following high school between 1977 and 1985 (when substance use peaked and then decline among the youth population), Cohort 2 between 1983 and 1990 (when substance use declined among the youth population), and Cohort 3 between 1988 and 1996 (when substance use declined and then began to increase among the youth population) (Johnston et al., 1997). Furthermore, as discussed previously, an important limitation of this strategy is that period effects are confounded with cohort and age effects (i.e., between-cohort differences may reflect both cohort and period effects, and age-related changes may reflect both age and period effects). These limitations should be kept in mind when considering the findings.

Life-path groups. The life-path groups were constructed based on young adulthood demographic characteristics gathered at Waves 2 and 3: full-time college attendance during the past year, full-time employment during the past year, living arrangements (i.e., whether residing with parents) during the past year, current marital status, and current parental status (i.e., whether respondent had one or more children or step-children). An important premise in forming the groups is that certain pursuits and experiences take precedence over others during this launching period and these defining pursuits and experiences serve to sort individuals into different paths. Furthermore, given finite time and financial resources, choosing one set of pursuits (e.g., full-time education) typically precludes other sets of pursuits (e.g., full-time employment). As shown in Table 2, 11 mutually-exclusive life-path groups were formed.[3]

The first three life-path groups comprised about 25% of the total sample and consisted of those respondents who were full-time college students at both Wave 2 and Wave 3, and at the same time were not employed full-time, were not married, and had no children. These are the individuals whose primary "occupation" immediately following high school is to attend college and remain there for at least three to four years. The distinction among these three college groups was whether they lived away from home at both follow-ups, lived at home with parent(s) at both follow-ups, or moved from home at Wave 2 to away at Wave 3.

The next three groups comprised about 15% of the total sample and consisted of those who were employed full time at both Wave 2 and 3, and at the same time were not married and had no children. Although it was possible that individuals in these groups could also be part-time or even full-time college students, their primary "occupation" is full-time employment. The distinction among these three was whether they lived at home with parents.

The next three groups comprised about 21% of the total sample and consisted of those who were married and/or had children at Wave 2 and/or Wave 3. Individuals in these groups are on the "family fast-track" (i.e., the average ages for first marriage and first pregnancy were in the mid-20's for the cohorts represented in the sample). In forming these three groups, given the relative infrequency of these family experiences during the launching period, no restrictions were placed on student or employment status. Furthermore, in forming the single parent group, no restrictions were made on living arrangements.

The "Uncommitted" group consisted of those who were neither married nor had children at both Waves 2 and 3, and at least at one of these waves, were neither attending college nor employed full-time. This group comprised about 14% of the total sample.

Finally, the "Other" group consisted of the remainder of the sample that did not fit into any of the first 10 groups. This group comprised about 25% of the total sample, indicating that three-fourths of the total sample fit into one of the 10 defined life-path groups.

With respect to gender differences, men were somewhat more likely than were women to be in the college-away group (17.9% v 15.9%), the employed groups (17.6% v 12.1%), and the uncommitted group (15.2% v 13.3%); men were much less likely to be in the marriage/children groups (14.4% v. 25.9%). With respect to cohort group differences, the college-away group increased in prevalence across the three cohort groups (13.6% v 16.5% v 20.2%), and the two marriage groups decreased (20.9% v 16.2% v 12.7%).

Measures

Well-being measures. Well-being was considered in terms of overall satisfaction with life (1 item), and three pairs of similar but opposing constructs: positive self-esteem (4 items, average alpha of .77; based on Rosenberg, 1965; see also O'Malley & Bachman, 1979, 1983) and self-derogation (4 items, average alpha of .78); self-efficacy (3 items, average alpha of .50; based on Nowicki & Strickland's, 1973, internal locus of control sub-scale) and fatalism (2 items, average alpha of .63); and social support (3 items, average alpha of .66) and loneliness (3 items, average alpha of .66; similar to Newcomb & Harlow, 1986). The same measures were used at all three waves. The magnitude of senior year correlations ranged from .19 between life satisfaction and self efficacy to -.55 between positive self-esteem and self-derogation. Details of the measures are provided in Table 3.

Substance use measures. Substance use measures included cigarette use (frequency in the past 30 days), alcohol use (occasions of use in past 30 days), binge drinking (frequency of having 5 or more drinks in a row during the past two weeks), and marijuana use (occasions of use in the past 12 months). These Monitoring the Future substance use items have been shown to demonstrate adequate psychometric properties, and their reliability and validity have been reported and discussed extensively (e.g., Johnston and O'Malley, 1985; O'Malley, Bachman, & Johnston, 1983). The same measures were used at all three waves. Senior year correlations ranged from .33 between cigarette use and binge drinking to .74 between alcohol use and binge drinking. Details of the measures are provided in Table 3.

Analysis Plan

To address the purposes of this study, we conducted 11 repeated-measures ANOVAs (conducted as MANOVAs), one for each well-being and substance use measure. These 11 measures at the three waves (ages 18, 19-20, and 21-22) were treated as the "dependent" variables in these analyses. The "independent" variables included cohort (3 levels), gender (2 levels), and life-path group (11 levels) as between-subject variables; and age (3 waves) as a within-subjects variable.[4] The MANOVAs were full-factorial (i.e., all two-, three- and four-way interactions were included).[5] Age effects (i.e., intraindividual change across the three waves) were partitioned into orthogonal polynomial contrasts to test for linear and quadratic age effects in well-being and substance use. (A summary of the analyses is provided in Schulenberg, O'Malley, Bachman, & Johnston, 1998.)

Overall between-subjects effects: Cohort, gender, and life-path differences. MANOVAs provide multivariate tests to examine overall between-subjects effects (averaged across ages 18-22). Clearly, to the extent that there are differential age effects in the dependent measures as a function of cohort, gender, and/or life-path, then these overall between-subject effects are not of primary interest. For significant main effects for cohort and life-path, Scheffe 95% confidence intervals were used to determine significant differences among the group means on the given outcomes. For cohort main effects, the emphasis was on pairwise comparisons among the three cohort groups (only two orthogonal pair-wise comparisons are possible, and when necessary to determine the significance of the third pair-wise comparison, post-hoc analyses were conducted). For life-path main effects, each group was compared to the total sample (10 orthogonal comparisons are possible, and the comparison of the "Other" life-path to the total sample was excluded). For significant multivariate interactions, post-hoc analyses were conducted using Scheffe 95% confidence intervals, focusing on comparisons of the interaction-based sub-groups to the total sample.

Within subjects effects: Differential change during the transition. The age-interaction terms provided the tests of whether and how cohort groups, gender groups, and life-path groups (and interactions among them) were associated with different patterns of age-related changes in well-being and substance use. For significant age by cohort interactions, pairwise comparisons of the age-change coefficients (i.e., linear and/or quadratic) for the three cohort groups was conducted. For significant age by gender interactions, the age-change coefficients of men were compared to those of women. For significant age by life-path interactions, the age-change coefficient for each group was compared to the age-change coefficient in the total sample. For three-way and four-way interactions, post-hoc analyses were conducted, with a similar focus on age-change coefficient comparisons.

RESULTS

The purpose of this study was to determine whether the individual-level course of well-being and substance use during the transition from adolescence to young adulthood varied as a function of cohort, gender and life-paths. There were four phases of the analyses: There were four phases of the analyses: (1) total sample consideration of the course of well-being and substance use during the transition from adolescence to young adulthood; (2) inter-cohort comparisons, including an emphasis on overall cohort differences (averaged across age -- i.e., across the three waves) in well-being and substance use, and on differential age-related change in well-being and substance use as a function of cohort; (3) gender comparisons, including an emphasis on overall gender differences, on overall cohort by gender interactions, and on differential age-related change as a function of gender and cohort by gender interactions; and (4) life-path comparisons, including an emphasis on overall life-path differences, on overall interactions involving life-paths and cohort and/or gender, and on differential age-related change as a function of life-paths and interactions involving life-paths and cohort and/or gender.

Phase 1. Course of Well-being and Substance Use in Total Sample

An overview of the findings from the 11 repeated measures MANOVAs is provided in Table 4 (a full summary of the findings is provided in Tables A-1 and A-2 in the appendix, and an abbreviated summary is provided in Schulenberg et al., 1998). Of primary concern in this first phase of the analysis is the first set of rows for "age" in the "within-subjects effects" section.

Well-being. As shown in Table 4, there were significant main effects for age for all of the well-being measures except life satisfaction, and that in each case, the shape of the significant age-related change was entirely or primarily linear. The total sample means for each well-being measure are displayed in Figure 2 (and provided in Table 3). In considering Figure 2, note that all measures had the same 1 to 5 response format, except life satisfaction (1-7 response format; see Table 3). As illustrated in the left panel, life satisfaction remained unchanged across the waves. Self esteem, self-efficacy, and social support increased significantly during the transition, with the increase being linear for the former two, and linear and quadratic for the latter (i.e., for social support, most of the increase occurred between waves 1 and 2). Likewise, as is shown in the right panel, self derogation, fatalism, and loneliness decreased significantly during the transition, and in each case, the decrease was linear. Thus, at least in the total sample, the transition to young adulthood was accompanied by increased well-being, and the rate of increase was generally constant across the waves.

Substance use. As indicated in Table 4, age effects were significant for each of the four substances. In the total sample, cigarette use, alcohol use, and binge drinking increased significantly with age, and these increases were primarily linear (means illustrated in Figure 3, but note that the response format and timeframe for each measure varied -- see Table 3). For 12 month marijuana use, the age effect was primarily quadratic, increasing between waves 1 and 2, and then decreasing between waves 2 and 3. Nevertheless, these total sample findings are qualified to a large extent by the cohort by age interactions discussed in the following sub-section.

Phase 2. Cohort Comparisons

The second phase of the analysis was to determine whether the courses of well-being and substance use during the transition to young adulthood just described varied across Cohort 1 (1976-81 senior year cohorts), Cohort 2 (1982-86 cohorts), and Cohort 3 (1987-92 cohorts).

Well-being. In terms of overall cohort main effects (averaged across age), the first row in Table 4 reveals no such effects for well-being. That is, for example, the average level of self esteem and self efficacy did not vary by cohort.

As shown in the second set of rows in the "within-subjects effects" section in Table 4, the cohort by age interaction was significant for both self-efficacy and fatalism, indicating that age-related change in these two measures varied as a function of cohort, and that the differences were in regard to linear age-related change. As shown in Figure 4, the linear increase in self-efficacy as well as the linear decrease in fatalism appeared to be somewhat greater for Cohort 1 than for the other cohorts.

And indeed, this differential age-related change by cohort for self efficacy and fatalism was confirmed based on the comparisons of the age-change coefficients for the three cohorts in the bottom portion of Table 5. As shown in the Self-Efficacy column in Table 5, the linear age-change coefficient for the total sample for self efficacy was significant and positive, indicating a significant increase with age (as revealed previously in Figure 2). In elaborating on the cohort by linear age interactions, the pairwise comparisons of linear change in the three cohorts revealed that the age-related increase was significantly greater in Cohort 1 than in Cohort 2 (.05*) and in Cohort 3 (.08**); the linear change in Cohorts 2 and 3 was similar (.03). Similarly, for fatalism, which decreased significantly in the total sample, the decrease age-related change was significantly greater in Cohort 1 than in Cohort 3, significantly greater in Cohort 2 than in Cohort 3, and not significantly different between Cohorts 1 and 2. Thus, the increase in self-efficacy and the decrease in fatalism that accompanies the transition to young adulthood is somewhat less pronounced in recent cohorts compared to earlier ones. Increases in other aspects of well-being during the transition, however, have remained constant over the past two decades.

Substance use. There was a significant overall cohort main effect for each substance use measure. As shown in the top portion of Table 5, the use of all four substances was significantly greater in Cohort 1 than Cohort 2, and except for cigarette use, significantly greater in Cohort 2 than Cohort 3.

As shown in Table 4, the course of each substance use measure across the transition varied as a function of cohort membership, and this variation took the form of linear change differences (for all but 30-day alcohol) and of quadratic change differences (for all but 30-day cigarette use). These variations are illustrated in Figures 5 and 6, and also revealed in the comparisons of change coefficients in Table 5. The linear age-related increase in cigarette use was significantly greater for Cohort 1 than for the other two cohorts. While the linear age-related increase in 30-day alcohol use was similar for the three cohorts, the negative quadratic effect (i.e., inverted U-shape) was significantly greater in Cohorts 1 and 2 than in Cohort 3 (i.e., the increase leveled-off between waves 2 and 3 for Cohorts 1 and 2, but not for Cohort 3). The

linear age-related increase in binge drinking was significantly greater in Cohort 3 than in Cohorts 1 and 2, and the quadratic interaction revealed that the change in binge drinking was significantly more quadratic for Cohort 1 than for Cohort 3. There was a slight overall age-related decrease in marijuana use, and this decrease was significantly greater for Cohort 2 than for Cohorts 1 and 3; the negative quadratic effect was significantly greater for Cohort 1 than for Cohorts 2 and 3.

Summary. The findings regarding substance use in this second phase of the analyses indicate that cigarette use was more prevalent and increased more rapidly during the transition in Cohort 1 than in Cohorts 2 and 3. In contrast, whereas overall levels of alcohol use, binge drinking, and marijuana use were lower for each succeeding cohort group, there is evidence that alcohol and marijuana use and especially binge drinking increased more rapidly for Cohort 3 compared to Cohorts 1 and 2 (e.g., the "leveling off" between waves 2 and 3 that occurred in the two earlier cohorts did not occur in the most recent one). At the same time, the more recent cohorts in comparison to the earlier ones were found to be experiencing a somewhat less pronounced increase in feelings of self-efficacy during the transition.

It is important to reiterate here that the analytic strategy, while useful and appropriate given the purposes of this chapter, served to confound period effects with age and cohort effects. For example, the lack of increase in marijuana use between Waves 1 and 2 for Cohort 2 may be due in part to the fact that all the Wave 2 measures occurred between 1983 and 1988, a period when there were significant declines occurring among young Americans generally.

Phase 3. Gender Comparisons

Well-being. It was found that overall (averaged across the three waves), men were significantly higher on self esteem and self efficacy, and significantly lower on self derogation, social support, and loneliness than were women (see significant multivariate main effects for gender in Table 4, and summary of gender differences in the top portion of Table 6). There was only one significant overall gender by cohort interaction (i.e., for loneliness, in which gender differences became more pronounced with succeeding cohorts), indicating that these overall gender differences have remained relatively constant over the past few decades.

Recall that in the total sample, self-esteem, self-efficacy, and social support increased, and that self-derogation, fatalism, and loneliness decreased, during the transition. The gender by age interaction was significant for self efficacy and social support (see Table 4), indicating that the age-related increase in these two measures varied by gender. As shown in the left panel of Figure 7, self efficacy was similar for men and women at wave 1, and while it increased significantly with age for both, the increase was greater for men than for women. Indeed, whereas self efficacy increased fairly steadily across the three waves for men, it increased for women only between waves 2 and 3 (reflected in the significantly greater positive quadratic effect for women than for men -- see Table 6). As shown in the right panel of Figure 7, social support increased more rapidly during the transition for men than for women (see also Table 6). For the remaining measures of well-being, change during the transition did not vary by gender indicating that self esteem increased in a similar fashion for men and women during the transition, with men starting higher and remaining higher than women; and that self derogation, loneliness, and fatalism decreased in a similar fashion for men and women, with women

beginning and remaining higher than men on the former two (see Figures A-1 and A-2 in the appendix). There were no significant gender by cohort by age interactions, indicating that these gender differences and similarities in age-related change in well-being during the transition did not vary by cohort over the past few decades.

Substance use. The findings revealed that overall (averaged across the three waves), compared to women, men were significantly lower on cigarette use and higher on alcohol use, binge drinking, and marijuana use (see Tables 4 and 6). In two of the four cases, these overall gender differences were modified slightly by the significant cohort by gender interactions (see Table 4): for both binge drinking and marijuana use, gender differences decreased with succeeding cohorts.

Recall that in the total sample, each substance use measure increased significantly during the transition. The significant gender by age interaction for each measure (see Table 4) indicates that the increase in substance use during the transition varied by gender. As is clear in Figures 8 and 9, and also shown by the gender comparisons of age-change coefficients in Table 6, the age-related linear increase in each measure of substance use was significantly greater for men than for women. There were no significant cohort by gender by age interactions.

Summary. There were overall gender differences in well-being, seemingly favoring men. In addition, self efficacy and social support increased more rapidly during the transition for men than for women. For the remaining well-being measures, the patterns of change during the transition were similar for men and women. For cigarette use, men started lower but increased more rapidly than women, with the two converging by Wave 3. For the other three substances, men started higher than women and these gender differences became amplified during the transition. With a few important exceptions (i.e., that gender differences in loneliness decreased, and gender differences in binge drinking and marijuana use decreased, with successive cohorts), gender did not interact with cohort, indicating that gender differences and similarities (overall and by age) in well-being and substance use have changed little over the past few decades.

Phase 4. Life-path Comparisons

In the final phase of the analysis, the courses of well-being and substance use during the transition for the 11 life-path groups (see Table 2) are compared, and interactions involving cohort and gender are examined.

Well-being. There were overall life-path differences in all well-being measures, except for social support (see Table 4). These differences are summarized in the top portion of Table 7 (for significant life-path overall and age interaction effects, means are displayed in Figures A-3 through A-6 in the appendix). For example, life satisfaction was significantly higher in the College-away (Ca) and Married-no children (Mn) groups, and significantly lower in the Single parents (Sp) and Uncommitted (U) groups, compared to the total sample. In each comparison, the College-away group was found to exhibit significantly greater than average well-being, and the Uncommitted group significantly lower than average well-being. Also, the Single parent group showed significantly lower than average well-being, except for with self esteem. The three college groups showed significantly greater than average self-efficacy, and significantly less than

average fatalism. There were no overall life-path by cohort interactions, and only one overall life-path by gender interaction (i.e., for social support -- post-hoc analyses revealed that gender differences were less pronounced in the married groups), indicating that these overall life-path differences have remained relatively constant over the past few decades, and were similar for men and women.

Recall once again that during the transition in the total sample: life satisfaction did not change; self-esteem, self-efficacy, and social support increased; and self-derogation, fatalism, and loneliness decreased. For both life satisfaction and loneliness, the multivariate life-path by age interaction was significant, indicating that age-related change in the former and the age-related decrease in the latter varied as a function of life-path. For life satisfaction, as shown in the bottom portion of Table 7, the Married-no children group showed a significantly greater linear age-related increase, and the Uncommitted group showed a significantly greater linear age-related decrease, compared to the total sample. In addition, compared to the total sample, the Married-parent group showed a significant negative quadratic trend (inverted U-shape) with age. These differential age-related changes are illustrated in Figure 10. As shown in Table 7 and Figure 11, loneliness decreased with age at a significantly faster than average rate for the College-away group, and decreased with age at a significantly slower than average rate for the Uncommitted group.

For the remaining five indices of well-being, change during the transition to young adulthood did not vary by life path. However, for both self esteem and self derogation, there was a slight but significant life-path by cohort by age interaction (post-hoc analyses revealed that with successive cohorts, the Uncommitted group showed progressively less pronounced increases in self esteem and decreases in self derogation during the transition). Otherwise, similarities and differences in age-related changes in well-being across the life-path groups did not varied by cohort, nor by gender (i.e., none of the life-path by gender by age interactions was significant).

Substance use. There were overall life-path differences in all substance use measures (see Table 4), and these differences are summarized in Table 7. All forms of substance use tended to be significantly greater than average among the employed groups, and significantly less than average among the married groups. The three college groups were significantly lower than average on cigarette use; with regard to alcohol use and binge drinking, the College-away group indulged at a significantly greater than average rate, whereas the College-home group indulged at a significantly lower than average rate. Both the Single parent and Uncommitted groups had higher than average cigarette and marijuana use.

As shown in Table 4, the overall life-path differences for each measure of substance use were qualified by significant cohort and gender interactions (mercifully, there were no three way interactions). For the cohort by life-path interactions, post-hoc analyses revealed that: (a) cohort differences in cigarette use were less than average among the college student and employed groups; (b) cohort differences in alcohol use and binge drinking were less than average among college students and single parents, and for binge drinking only, among the married groups; and (c) cohort differences in marijuana use were greater than average in the College-away group. These qualifications to both the cohort main effects and life-path main effects underscore the importance of considering intra-cohort variation when making inter-cohort comparisons.

For the gender by life-path interactions, post-hoc analyses revealed that: (a) gender differences in cigarette use were isolated to the Employed-away and Uncommitted groups, with women's use being higher than men's use in these groups (in the other life-path groups, there were no significant gender differences); (b) gender differences in 30 day alcohol use were less pronounced among college students; (c) gender differences in binge drinking were more pronounced among those who were parents; and (d) gender differences in marijuana use were least pronounced among Employed-away and Employed-home/away groups, and most pronounced among Single parents. These findings indicate that gender differences in substance use vary considerably across different life experiences during the transition to young adulthood.

Recall once again that each substance use measure increased during the transition to young adulthood. As revealed by the significant life-path by age interactions (see Table 4), age-related changes in substance use varied as a function of life-paths. As shown in Table 7 and Figure 12, the linear age-related increase in cigarette use was significantly more rapid than average for the Employed-away, Employed-home/away, Single-parent, and Uncommitted groups; and it was significantly slower than average for the College-home and two married groups. Based on the quadratic effects, the pattern of more rapid increase between waves 1 and 2 than between waves 2 and 3 was more pronounced than average for the Employed-away group, and less than average for the College-away group. There was a significant gender by life-path by age interaction, and based on post-hoc analyses, it was found that in the Married-parent and Single-parent groups, men were more likely to increase cigarette use during the transition than were women.

As shown in Table 7 and Figure 13, the linear age-related increase in 30-day alcohol use during the transition was significantly greater for the College-away and College-home/away groups, and significantly less for the Employed-home and two married groups. Based on the quadratic effects, the age-related change was more rapid between waves 1 and 2 than between waves 2 and 3 for the College-away and Employed-away groups, with an opposite pattern being found for the Employed-home, Employed-away, Married-parent, and Uncommitted groups. There was a significant gender by life-path by age interaction, and based on post-hoc analyses (and in accord with what was found for cigarette use), it was found that in the Married-parent and Single-parent groups, women were more likely to decrease their use than were men.

As indicated in Figures 14 and 15 and Table 7, the findings for binge drinking and marijuana use were quite similar to those just described for 30-day alcohol use: both increased significantly more rapidly with age for the College-away and College-home/away groups, and increased less rapidly (actually decreased) for the two married groups. Likewise, the increase in binge drinking was significantly more quadratic (negative) for the College-away and Employed-away groups, and less so for the Employed-home group; for marijuana use, this quadratic effect was significantly greater for the College-away group and less for the Married-parent group. One notable difference in the findings for marijuana use was that it increased significantly faster than average for the Uncommitted group.

Summary. In this fourth and final phase of the analysis, much ground was covered, making this summary necessarily selective. Significant overall life-path differences were found for all but one well-being measure (social support). Two clear patterns in these many overall

differences were that the College-away group tended to exhibited consistently higher than average levels of well-being, and the Uncommitted group consistently lower than average levels. Differential age-related change as a function of life-path was found for life satisfaction and loneliness. Getting married during young adulthood was associated with increased life satisfaction, although having children subsequently decreased life satisfaction. Remaining uncommitted to young adulthood roles was associated with decreased life satisfaction as well as a less than average decrease in loneliness during the transition. Leaving home to attend college full-time was associated with a greater than average age-related decrease in loneliness. There was no age-related differential change as a function of life-path for the other well-being measures, indicating that the many initial differences in well-being among the life-path groups remained intact as well-being increased during the transition. There were few cohort or gender interactions, indicating that similarities and differences in well-being among the life-path groups were relatively constant across cohorts and gender.

Overall differences in substance use were clearly evident among the life-path groups, with those in the employed groups showing higher than average use, and those in the married groups showing less than average use. Whereas the college groups had lower than average cigarette use, alcohol use and binge drinking was higher than average in the College-away group. The Uncommitted group had higher than average cigarette and marijuana use. Many of these overall differences were qualified by the significant cohort and gender interactions. For example, the large cohort differences in cigarette and alcohol use and binge drinking discussed previously were less pronounced among college students. And gender differences in binge drinking and marijuana use were more pronounced among the Married-parent and Single-parent groups. There was clear evidence of differential age-related change in substance use as a function of life-path. For example, all forms of substance use increased less rapidly during the transition (or even decreased) for the two married groups; alcohol and marijuana use and binge drinking increased more rapidly for the College-away and College-home/away groups; cigarette and marijuana use increased more rapidly for the Uncommitted group; and for the two groups that left home immediately following high school (College-away and Employed-away), the age-related increase in alcohol use and binge drinking was especially rapid between waves 1 and 2. None of this differential change among the life-paths varied as a function of cohort, but it did vary as a function of gender, with women showing less age-related increase in cigarette and alcohol use than men in the parent groups.

SUMMARY AND CONCLUSIONS

Moving from high school into young adulthood is a critical developmental transition, a time of both continuity and discontinuity in health and well-being. As we have shown in this paper, how well one negotiates this transition, as evidenced by one's course of well-being and substance use, depends in part on historical cohort, gender, and life-path. Using U.S. national panel data from 17 consecutive cohorts from the Monitoring the Future study, we examined age-related change in well-being and substance use during the first four years following high school -- the "launching period" between adolescence and young adulthood. We examined whether the age-related changes in well-being and substance use varied as a function of cohort group (i.e., senior year cohorts 1976-81 v 1982-86 v 1987-92), gender, and life path group (i.e., 11 mutually exclusive life-paths defined according to educational and employment status, living arrangements, and marital and child status during the transition to young adulthood). The findings are summarized below.

Overall Changes in Well-being and Substance Use During the Transition to Young Adulthood

In the total sample, we found that well-being increased significantly during the transition to young adulthood (i.e., self-esteem, self-efficacy, and social support increased; self-derogation, fatalism, and loneliness decreased), a finding consistent with previous studies (e.g., Aseltine & Gore, 1993; O'Malley & Bachman, 1979, 1983). Substance use (i.e., cigarette, alcohol, and marijuana use; binge drinking) was also found to increase significantly during the transition, although as discussed below, these findings were qualified to a large degree by cohort differences. It is likely that the increases in both well-being and substance use have a common origin in terms of leaving behind the constraints of the high school role and entering new roles and contexts that provide more freedom and opportunities (e.g., Bachman et al., 1997; Brook, Balka, Gursen, & Brook, 1997; Kandel & Davies, 1986).

Cohort Group Differences and Similarities in the Course of Well-being and Substance Use

Although there were no overall differences (averaged across age) in well-being among the three cohort groups, it was found that the course of self-efficacy and fatalism during the transition differed somewhat among the cohorts. In particular, self-efficacy did not increase as much, and fatalism did not decrease as much, in the more recent cohorts compared to the earlier ones, indicating that the "boost" in efficacious feelings one typically gets upon entering young adulthood may have become less powerful among recent cohorts. This may reflect changing demographic and economic forces, resulting in the perception of more constricted job markets and future prospects, perhaps representing a popular view among members of "Generation X" that their career and economic success will fall short of that of their parents (Holtz, 1995). Nevertheless, it would be unwise to make too much of this finding given the small effects and the lack of cohort-based differential changes in the other measures of well-being. Indeed, the more general conclusion is that overall, the course of well-being during the transition to young adulthood has been quite similar across the past two decades.

In contrast, the course of substance use during the transition varied considerably by cohort group, and to the extent that substance use poses health risks, there is both good news and bad news. The "good news" is that, consistent with previous findings from the Monitoring the Future study (e.g., Bachman, Johnston, O'Malley, & Schulenberg, 1996; Johnston et al., 1998; O'Malley, Bachman, & Johnston, 1988), overall cohort differences (average across age) in substance use were found, with substance use being higher in Cohort 1 (1976-81) than Cohort 2 (1982-86), and, except for cigarette use, higher in Cohort 2 than in Cohort 3 (1987-92). To a large extent, these differences between cohorts represent period effects, with substance use generally declining among young people during the 1980s and early 1990s. These period effects reflect increased disapproval of substance use among young people, as well as increased perceptions that substance use is risky (e.g., Bachman et al., 1996; Johnston et al., 1998), representing a typical course of drug epidemics (Johnston, 1991). Cigarette and alcohol use are also influenced by changes in legal and economic sanctions, and the lower rates of alcohol use at ages 18-20 among more recent cohorts reflects to some extent the increase in the federal legal drinking age from 18 to 21 between 1984 and 1987 (O'Malley & Wagenaar, 1991).

The "bad news" is that alcohol and marijuana use and especially binge drinking increased more rapidly during the transition for Cohort 3 than the two earlier cohorts. To the extent that a more rapid increase in substance use reflects difficulties with the transition (either as a contributor or consequence), then this more rapid increase among more recent cohorts is troubling. In contrast, it may reflect a lengthening of the transition period providing more "free time" before assuming adulthood roles for the more recent cohorts.

Gender Differences and Similarities in the Courses of Well-being and Substance Use

On nearly all measures, men reported higher levels of well-being compared to women, and in the two cases of differential age-related change in well-being as a function of gender (i.e., for self-efficacy and social support), the increase was greater for men than for women. There was little evidence that these gender differences varied by cohort. These findings are consistent with the literature that men report greater well-being than women beginning in adolescence (e.g., Ge, Lorenz, Conger, Elder & Simons, 1994; Petersen et al., 1993), and indicate that these differences remain intact even during the transition to young adulthood when well-being tends to increase for all (e.g., Gore et al., 1997; Hankin et al., 1998; Kandel & Davies, 1986).

Men also reported higher levels of substance use (except for cigarettes) than women, and during the transition, substance use increased more rapidly for men than for women. These findings are in accord with the wealth of evidence (discussed previously) that men are more likely to indulge in psychoactive substances, and are consistent with the differential rates of entry into such adulthood roles as marriage and parenthood (both occur earlier for women than for men). Nevertheless, there was some evidence (i.e., gender by cohort interaction) to indicate that gender differences are eroding: for both binge drinking and marijuana use overall gender differences across the transition decreased with successive cohorts, perhaps reflecting the increased ages of first marriage and first pregnancy over the past few decades.

Life-path Differences in the Courses of Well-being and Substance Use

The life-path analyses revealed a wealth of findings. Overall differences (averaged across age) in well-being were found across the life paths, with those in the College-away group evidencing higher than average levels of well-being and those in the Uncommitted group evidencing lower than average levels. These overall differences varied little by gender or cohort. There were life-path differences in the course of well-being. Life satisfaction increased for those who became married, and decreased for those in the Uncommitted group. Similarly, loneliness decreased at a slower than average rate for the Uncommitted group, and in contrast, decreased at a faster than average rate for the College-away group. The Uncommitted and College-away groups appear to represent opposite extremes in terms of well-being during the transition to young adulthood, and while there was evidence to indicate that these two groups were initially different in well-being, there also was evidence to indicate increased divergences in well-being between these two groups as a function of young adulthood opportunities and experiences. It is important to recognize, however, that for five of the seven indices of well-being, age-related change did not vary by life-path, indicating that initial differences between life-paths remained intact during the transition. These life-path differences varied little by cohort and gender.

There were many overall differences (averaged over age) in substance use among the life-paths, with the employed groups showing higher levels of substance use and the married groups showing lower levels, a set of findings consistent with other analyses of the Monitoring the Future data (e.g., Bachman et al., 1997). These overall life-path differences were qualified to some extent by cohort interactions and gender interactions. For example, both cohort and gender differences in alcohol use were less pronounced among the college groups, reflecting the consistently high levels of alcohol use on college campuses across the past two decades among men and women.

The age-related course of substance use varied by life-path, with substance use typically increasing more rapidly for those who leave home to go to college and for those in the Uncommitted group, and increasingly less rapidly (or even decreasing) for those who marry. While these life-path differences in the course of substance use during the transition varied somewhat by gender (e.g., parenthood is associated with a greater decrease in substance use for women than for men), they did not vary by cohort group, suggesting that social change influences on the course substance use during the transition have been rather uniform.

Limitations and Future Directions

An important strength of this investigation was the use of national, multiple-cohort, panel data spanning a four-year period between late adolescence and young adulthood. In particular, the use of multi-cohort national panel data to construct and study life-paths represents a powerful approach to understanding change over time that is possible only through large-scale survey research (e.g., Jackson & Antonucci, 1994; Schulenberg, Wadsworth, et al., 1996). Of course, such large scale efforts must be complemented with smaller-scale more intensive efforts to provide a fuller understanding of health and well-being during the transition to young adulthood.

Because the sample included only those who graduated from high school, generalizability of the findings to the non-college population may be limited. Future research could improve on the study by starting earlier in adolescence to gain a better "before" picture, as well as a more representative sample. Caution in interpreting the findings is needed given the remaining confounds between age, period, and cohort effects. In particular, it is likely that the differential patterns of age-related change found for marijuana use reflect more of a secular trend than a cohort effect, with marijuana use generally declining for all during the mid- to late-1980's (see Johnston et al., 1998; O'Malley et al., 1988). Because we do not have direct measures of social changes (or perceptions of social changes) any attempts to explain any cohort group differences must rely on inferred social changes.

Although the use of multiple waves of panel data represents an important strength, the two year lag between the waves limits precision in specifying the life-paths, and in charting the course of well-being and substance use. In addition, the well-being measures available in project lack some depth, perhaps a forgivable limitation of secondary analyses of national panel data (Brooks-Gunn, Phelps, & Elder, 1991). Corroboration based on other studies that include more intensive measurement of health and well-being would be useful in this regard.

There were sufficiently clear patterns in our statistically significant findings to indicate their substantive significance. Still, most of the effects were small to moderate. The transition to young adulthood is multi-faceted, a quality not fully captured in the characteristics we selected to reflect experiences typical of this transition. A more comprehensive consideration of normative and non-normative transitional experiences may yield more powerful links between the experiences and changes in well-being and substance use. Future research in this area would do well to consider the reciprocal influences between life paths and health and well-being.

Conclusions

The transition out of high school and into young adulthood is associated with an increased sense of well-being. While the present study showed that the post-high school upturn in some aspects of well-being varied somewhat by cohort, gender, and life path, it is clear that for the most part, launching into young adulthood is associated with increases in self esteem, self-efficacy, and social support. Is the high school experience, especially the end of it, really "that bad"? Or is the post-high school experience really "that good"? In all likelihood, the findings reflect some of each, with the transition out of high school contributing to a better match between one's developmental needs and one's contexts and experiences, which in turn contributes to increased well-being (see Schulenberg et al., 1997). Indeed, the only exception to this widespread increase in well-being is for those who appear to not connect with post-high school experiences - i.e., the Uncommitted group who are not progressing in terms of educational, occupational, or family pursuits.

The transition out of high school is also associated with increased substance use. But the increase in substance use is not as widespread as the increase in well-being and it appears more influenced by social change. The extent of increase, or even whether substance use increases, depends considerably on one's life path, with greater increases being associated with leaving the home and lesser increases (or even decreases) being associated with getting married (see

Bachman et al., 1997). While few would argue that this upturn in substance use is healthy for young people, a period of experimentation and even excess with drugs, especially alcohol, appears to be normative during the transition to young adulthood (e.g., Schulenberg, O'Malley, Bachman, Wadsworth, & Johnston, 1996); it may even be viewed by young people as assisting in their negotiating developmental transitions (e.g., Maggs, 1997; Silbereisen & Reitzle, 1992). Clearly, those who indulge too often and too much place themselves and others at risk for health and psychosocial difficulties, but these risks typically subside when (and if) individuals progress into adulthood roles and reduce their use. The important exception is cigarette use -- nicotine dependence makes the stakes of young adult experimentation quite high indeed, because the majority of those who smoked regularly in their teens retained the habit throughout their twenties and beyond (Bachman et al., 1997).

Has the transition to young adulthood become more difficult over the past two decades? Perhaps, but the evidence is not at all overwhelming. It does appear that the increase in self-efficacy (and the concomitant decrease in fatalism) that accompanies the transition has been somewhat less pronounced among recent cohorts compared to earlier ones. And for those in the "uncommitted" group in particular, it appears that the boost in self esteem has diminished among more recent cohorts. Although the more recent cohorts have lower initial levels of alcohol and marijuana use, the findings indicate that the increase during the transition is greater for the more recent cohorts. The relatively rapid increase in binge drinking among the recent cohorts is especially noteworthy (see Figure 6).

The findings provide evidence for both continuity and change in the adolescent experience over the past two decades, with well-being representing the former and substance use representing the latter. Absolute levels of well-being have changed little, and the same is true for gender and life-path differences in well-being. The absolute levels of substance use have changed considerably over the past two decades, as have gender differences in substance use (e.g., gender differences in binge drinking and marijuana use have diminished with successive cohorts) and life path differences in substance use (e.g., cohort differences in cigarette use, alcohol use, and binge drinking were less pronounced among college students). (Note, however, that life path differences in *age-related changes* in substance use during the transition did not vary by cohort groups.) There are several possible explanations for the distinction between the findings for well-being and substance use, including that substance use is more of a social behavior and perhaps more swayed by changes in the social context, whereas well-being represents more in terms of personality characteristics that may be less influenced by social change (cf. Nesselroade & Baltes, 1974; Reese & McCluskey, 1984).

The final set of conclusions pertains to how we study change over time. Studying change over time, at either the individual or societal level, is among the most difficult tasks facing developmental scientists. Studying both levels simultaneously to determine how social change may influence the course of individuals' lives is challenging at best, and profoundly frustrating at the very least (cf. Cairns & Cairns, 1995; Elder, 1998). Rarely is social change sufficiently discrete such that meaningful demarcations are possible, or sufficiently pervasive such that widespread effects can be observed. One exception was the Great Depression in the United States in 1929, and a more recent one is the fall of the Berlin Wall in Germany in 1989. And even in these rare instances, there may be little forewarning of the impending monumental social

change. Instead, social change is typically an accumulation of major and more often minor events that are caused by the confluence of social, political, demographic, technological, and economic forces, and whose importance is determined after the fact.

By all means, for those rare exceptions when monumental and discrete social change occurs, developmental scientists should be standing by (ideally with "pre-test" data already in hand) to examine the interconnections between social and individual change. Otherwise, at least two interdependent approaches are available to the interested developmental scientist (e.g., Noack & Kracke, 1997; Schaie, 1984). The first, as exemplified by the Iowa Youth and Families Project in the United States (e.g., Conger & Conger, this volume; Elder, Hagell, Rudkin, & Conger, 1995) and the Leipzig-Mannheim study in Germany (e.g., Noack & Kracke, 1997; Noack, Hofer, Dracke, & Klein-Allermann, 1995), is to focus on a segment of society that is experiencing fundamental social change with sufficient depth so as to track the movement of social change through communities and families and to examine its influence on how individuals negotiate various developmental transitions. The second, as exemplified by the present study, and more generally by the Monitoring the Future project, is to monitor successive cohorts as they pass through the various developmental transitions to determine inter- and intra-cohort variation in the markers of the course of health and well-being. The former approach can offer needed insight into how social change translates into differential change at the individual level, and it can provide testable hypotheses for the latter approach. The latter approach provides valuable information on variation and constancy in the adolescent experience over historical time that can offer testable hypotheses for the former approach; it provides the "big picture" that can serve as the requisite backdrop to the former approach, and it stands ready as social change unfolds. More dialogue between these two approaches is needed.

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ENDNOTES

1. Because respondents with more frequent senior year illicit drug use were oversampled by a factor of 3 for follow-up, corrective weighting of .333 was required for those individuals. All analyses were conducted using the weighted sample.

2. Preliminary analyses indicated that shifting the cohort groupings by one or two years would not yield findings substantially different from those presented in this chapter.

3. Preliminary analyses were conducted to determine if it was possible to combine some of these groups (e.g., the employed-away and the employed-home/away), but it was found that such combinations would have resulted in the loss of some important information.

4. Although we were unable to avoid violating some assumptions of using Repeated Measures ANOVAs (i.e., MANOVAs), we decided to use this procedure for two reasons: 1) MANOVAs tend to be robust to the violations we encountered; and 2) the clarity of the correspondence between the pattern of statistically significant findings and the several illustrations of the means argued for the validity of the inferential statistics, and among the various analytic options, the MANOVA strategy provided the most straightforward way to address the purposes of this study. Because of the unbalanced design (i.e., independent variables are not orthogonal), order of entry of independent variables was a concern (e.g., Stevens, 1986); the selected order (i.e., cohort, gender, life paths) reflected extent to which the variables were exogenous, and preliminary analyses (in which the order was reversed) revealed that order of entry had little impact on significant findings. Although there were moderate intercorrelations among many of the dependent variables, we decided against the use of "doubly Multivariate" ANOVAs (i.e., Repeated Measures MANOVAs) because there was some amplification of relationships among the well-being variables with age and some disintegration of relationships among the substance use variables with age, as well as because of an already complex analytic design.

   In terms of assumption violations, <u>first</u>, the normal distribution of outcomes assumption was not always met, but the ANOVA is robust to violation of this assumption especially when the sample size is large (e.g., Stevens, 1986). <u>Second</u>, the homogeneity of variance across groups assumption was not met for all of the dependent variables, with the variances sometimes being larger for the smaller life-path groups. This may contribute to the actual <u>p</u> level exceeding the nominal <u>p</u> level, suggesting a slightly increased chance of Type I errors (Stevens, 1986). Nevertheless, as indicated in Tables 4-7 and Tables A-1 and A-2 in the appendix, the vast majority of relevant significant F-tests and change coefficients were significant at the .001 level, suggesting that the slightly inflated chance of Type I errors had little substantive impact on the total picture of results. <u>Third</u>, for each outcome, the sphericity assumption was violated, although the Greenhouse-Geisser epsilon ranged from .95 to .98, suggesting that the violations were quite minor (when epsilon=1, partitioned age effects are orthogonal). Given these violations of assumptions, as well as the large number of analyses conducted, a moderate but not excessive amount

of caution is needed when interpreting the findings.

5. There was an initial concern with the potential for small-cell difficulties in these four-way MANOVAs for the well-being analyses (66 cells, with n = 3,586). Thus, after the four-way MANOVAs were conducted, two sets of three-way MANOVAs (i.e., cohort by gender by age; life-paths by gender by age) were conducted only for the well-being measures. With very few minor exceptions, these analyses yielded conclusions consistent with those from the four-way analyses.

TABLES

Table 1. Comparison of Institutional Structure to Facilitate Developmental Transition: Transition into Adolescence vs. Transition into Young Adulthood.

	Transition into: Adolescence	Young Adulthood
Begins	puberty	??
Role Options/ Activities	limited & uniform	extensive & varied
Continuity of Tasks/ Experiences	some	little
Increased Responsibility/ Freedom	some/ some	some/ extensive

Table 2. Life paths into young adulthood: Group definitions and percentages.

	Group	Percentage of sample	Full time student (wave 2/3)	Full time employed (wave 2/3)	Live with parent(s) (wave 2/3)	Marital status (wave 2/3)	Children (wave 2/3)
1.	College-away	16.3%	Y & Y	N & N	N & N	N & N	N & N
2.	College-home	5.1	Y & Y	N & N	Y & Y	N & N	N & N
3.	College-home/away	3.5	Y & Y	N & N	Y & N	N & N	N & N
4.	Employed-away	3.6	-- & --	Y & Y	N & N	N & N	N & N
5.	Employed-home	7.7	-- & --	Y & Y	Y & Y	N & N	N & N
6.	Employed-home/away	3.4	-- & --	Y & Y	Y & N	N & N	N & N
7.	Married, no child	9.0	-- & --	-- & --	-- & N[a]	-- & Y	N & N
8.	Married and parent	7.7	-- & --	-- & --	-- & N[a]	-- & Y	Y &/or Y
9.	Single parent	4.5	-- & --	-- & --	-- & --	N & N	Y &/or Y
10.	Uncommitted	14.1	N &/or N[b]	N &/or N[b]	-- & --	N & N	N & N
11.	Other	25.1					

Note: Wave 2 = age 19-20; Wave 3 = age 21-22.
Y = yes; N = no; -- = either yes or no.
weighted n = 21,134; cohorts = 1976-92.

a. In addition to not living with own parent(s), respondent could not be living with spouse's parent(s).

b. To be included in the Uncommitted group, it was necessary for respondent to be neither a full time student nor employed full time at Wave 2 *and/or* at Wave 3.

Table 3. Summary of Measures

Scale/Item	Description/Sample Item	Total Sample Means (standard deviations) Wave 1	Wave 2	Wave 3
Well Being				
Life Satisfaction	How satisfied are you with your life as a whole these days?[a]	4.95 (1.21)	4.95 (1.21)	4.97 (1.22)
Self Esteem	I take a positive attitude toward myself.[b]	4.20 (.58)	4.26 (.57)	4.31 (.56)
Self Derogation	I feel my life is not very useful.[b]	2.03 (.75)	1.84 (.73)	1.72 (.70)
Self-efficacy	When I make plans, I am almost certain I can make them work.[b]	3.86 (.68)	3.92 (.69)	4.01 (.66)
Fatalism	Every time I try to get ahead, something or somebody stops me.[b]	2.08 (.73)	1.97 (.72)	1.91 (.71)
Social Support	There is always someone I can turn to if I need help.[b]	4.28 (.70)	4.41 (.63)	4.41 (.62)
Loneliness	I often wish I had more good friends.[b]	2.94 (.88)	2.77 (.90)	2.66 (.87)
Substance Use				
Cigarette Use	How frequently have you smoked cigarettes during the past 30 days?[c]	1.66 (1.24)	1.78 (1.40)	1.84 (1.49)
Alcohol Use	On how many occasions have you had alcoholic beverages to drink during the past 30 days?[d]	2.49 (1.51)	2.76 (1.57)	2.92 (1.58)
Binge Drinking	Think back over the last two weeks. How many times have you had five or more drinks in a row?[e]	1.75 (1.22)	1.84 (1.26)	1.87 (1.26)
Marijuana Use	On how many occasions (if any) have you used marijuana or hashish during the past 12 months?[d]	2.15 (1.93)	2.23 (1.99)	2.17 (1.97)

Note. Total sample includes senior year cohorts 1976-92 (N = 21,134 for substance use measures; N = 3,586 for the well-being measures); modal ages were 18, 19-20, and 21-22, for the three waves, respectively.

a. possible responses ranged from 1 (completely dissatisfied) to 7 (completely satisfied)
b. possible responses ranged from 1 (disagree) to 5 (agree)
c. possible responses ranged from 1 (not at all) to 7 (two packs or more per day)
d. possible responses ranged from 1 (0 occasions) to 7 (40 or more)
e. possible responses ranged from 1 (none) to 6 (ten or more times)

Table 4. Overview of Repeated Measures ANOVAs Results for Well-Being and Substance Use.

	Well-Being							Substance Use			
	Life Sat.	Self-Esteem	Self-Dero.	Self-Effic.	Fatal.	Social Sup.	Lone.	30day Cig.	30day Alc.	Binge Drink.	12mo. Marij.
Between-Subjects Effects											
Cohort (C)								***	***	***	***
Gender (G)		***	***	**		***	**	*	***	***	***
Life Path (P)	***	***	***	***	***		***	***	***	***	***
C*G							*			*	***
C*P								**	**	***	***
G*P						*		**	***	*	*
C*G*P											
Within-Subjects Effects											
Age (A)		***	***	***	***	***	***	***	***	***	***
linear		***	***	***	***	***	***	***	***	***	*
quadratic						**		***	*		***
C*A				*	*			**	***	**	***
linear				**	**			***		*	***
quadratic									***	**	***
G*A				**		**		***	***	***	***
linear						**		***	***	***	***
quadratic				**							
P*A	***						*	***	***	***	***
linear	**						**	***	***	***	***
quadratic	*							**	***	***	***
C*G*A											
linear											
quadratic											
C*P*A		*	*								
linear		**	*								
quadratic											
G*P*A								***	*		
linear								***	*		
quadratic											
C*G*P*A											
linear											
quadratic											

Note. See Tables A-1 and A-2 in Appendix for a full summary of the analyses and findings.
*** = $p<.001$, ** = $p<.01$, * = $p<.05$.

Table 5. Summary of Significant Overall Cohort and Cohort by Age Effects

a. Overall Cohort Effects (averaged across age)

Cigarette Use	1 > 2 = 3
Alcohol Use	1 > 2 > 3
Binge Drinking	1 > 2 > 3
Marijuana Use	1 > 2 > 3

b. Cohort by Age Interactions: Age-Change Coefficients

Age and Cohort Effects	Age-Change Coefficients					
	Self-Efficacy	Fatalism	30 day Cigarette	30 day Alcohol	Binge Drinking	12 month Marijuana
Linear Age Effects:						
Overall[a]	.11***	-.13***	.14***	.27***	.06***	-.02*
Interactions[b]						
1 v 2	.05*	-.04	.04*	--	.00	.11***
1 v 3	.08**	-.13***	.07***	--	-.05*	.03
2 v 3	.03	-.08*	.03	--	-.05*	-.08**
Quadratic Age Effects:						
Overall[a]	.02	.00	-.03***	-.02*	.00	-.05***
Interactions[b]						
1 v 2	--	--	--	-.01	-.03	-.06**
1 v 3	--	--	--	-.05*	-.06**	-.08***
2 v 3	--	--	--	-.10***	-.03	.02

Note. Cohort 1 = 1976-81; Cohort 2 = 1982-86; Cohort 3 = 1987-92

a. These age-change coefficients are for the total sample. Significant positive and negative linear effects refer to linear-shaped age-related increase and decrease, respectively; significant positive and negative quadratic effects refer to U-shaped and inverted U-shaped age-related patterns, respectively.

b. These age-change coefficients represent pairwise comparisons of age-related change in each cohort. Significant positive and negative linear coefficients refer to significantly more positive and negative age-related linear change, respectively, in the first cohort in the comparison versus the second; significant positive and negative quadratic coefficients refer to significantly more positive and negative quadratic effects, respectively, in the first cohort in the comparison versus the second. The third comparison was obtained in post-hoc analyses.

Table 6. Summary of Significant Overall Gender and Gender by Age Effects

a. Overall Gender Effects (averaged across age)

Self Esteem	m > f
Self Derogation	m < f
Self Efficacy	m > f
Social Support	m < f
Loneliness	m < f
Cigarette Use	m < f
Alcohol Use	m > f
Binge Drinking	m > f
Marijuana Use	m > f

b. Gender by Age Interactions: Age-Change Coefficients

Age and Gender Effects	Age-Change Coefficients					
	Self-Efficacy	Social Support	30 day Cigarette	30 day Alcohol	Binge Drinking	12 month Marijuana
Linear Age Effects:						
Overall[a]	.11***	.11***	.14***	.27***	.06***	-.02*
Interaction[b]						
m v f	--	.08**	.08***	.17***	.09***	.08***
Quadratic Age Effects:						
Overall[a]	.02	.00	-.03***	-.02*	.00	-.05***
Interaction[b]						
m v f	-.08**	--	--	--	--	--

a. These age-change coefficients are for the total sample. Significant positive and negative linear effects refer to linear-shaped age-related increase and decrease, respectively; significant positive and negative quadratic effects refer to U-shaped and inverted U-shaped age-related patterns, respectively.

b. These age- change coefficients represent gender comparisons of age-related change. Significant positive and negative linear coefficients refer to significantly more positive and negative linear age-related change, respectively, for males than for females; significant positive and negative quadratic coefficients refer to significantly more positive and negative quadratic effects, respectively, for males than for females.

Table 7. Summary of Significant Overall Life Path and Life Path by Age Effects

a. Overall Life Path Effects (averaged across age)

Life Satisfaction	Ca, Mn	> T >	Sp, U
Self Esteem	Ca	> T >	Eha, U
Self Derogation	Sp, U	> T >	Ca
Self Efficacy	Ca, Ch, Cha	> T >	Eh, Sp, U
Fatalism	Eh, Mp, Sp, U	> T >	Ca, Ch, Cha
Loneliness	Sp, U	> T >	Ca, Mn
Cigarette Use	Ea, Eh, Eha, Mp, Sp, U	> T >	Ca, Ch, Cha
Alcohol Use	Ca, Ea, Eha	> T >	Ch, Mn, Mp
Binge Drinking	Ca, Ea, Eh, Eha	> T >	Ch, Mn, Mp
Marijuana Use	Ea, Eha, Sp, U	> T >	Mn, Mp

b. Cohort by Age Interactions: Age-Change Coefficients

Age and Life Path Effects	Age-Change Coefficients					
	Life Satisfaction	Loneliness	30 day Cigarette	30 day Alcohol	Binge Drinking	12 month Marijuana
Linear Age Effects:						
Overall[a]	.00	-.21***	.14***	.27***	.06***	-.02*
Interactions[b]						
Ca	--	-.11***	--	.38***	.32***	.30***
Ch	--	--	-.11***	--	.07*	--
Cha	--	--	--	.30***	.22***	.21***
Ea	--	--	.15***	--	--	--
Eh	--	--	--	-.11***	--	--
Eha	--	--	.09**	--	--	--
Mn	.24**	--	-.11***	-.26***	-.23***	-.24***
Mp	--	--	-.12***	-.49***	-.30***	-.33***
Sp	--	--	.13***	--	--	--
U	-.16**	.10**	.07***	--	--	.07**
Quadratic Age Effects:						
Overall[a]	.01	.00	-.03***	-.02*	.00	-.05***
Interactions[b]						
Ca	--	--	.03*	-.15***	-.13***	-.11***
Ch	--	--	--	--	--	--
Cha	--	--	--	--	--	--
Ea	--	--	-.07**	-.09*	-.08**	--
Eh	--	--	--	.10***	.07**	--
Eha	--	--	--	.08*	--	--
Mn	--	--	--	--	--	--
Mp	-.23**	--	--	.06*	--	.09**
Sp	--	--	--	--	--	--
U	--	--	--	.05*	--	--

Table 7. continued

Note. Analyses were conducted on the total sample, including the "Other" life path group. Age-change coefficients for the Other group are not included.

T = Total sample
Ca = College-Away
Ch = College-Home
Cha = College-Home/Away
Ea = Employed-Away
Eh = Employed-Home
Eha = Employed-Home/Away
Mn = Married, no children
Mp = Married parent
Sp = Single parent
U = Uncommitted

a. These age-change coefficients are for the total sample. Significant positive and negative linear effects refer to linear-shaped age-related increase and decrease, respectively; significant positive and negative quadratic effects refer to U-shaped and inverted U-shaped age-related patterns, respectively.

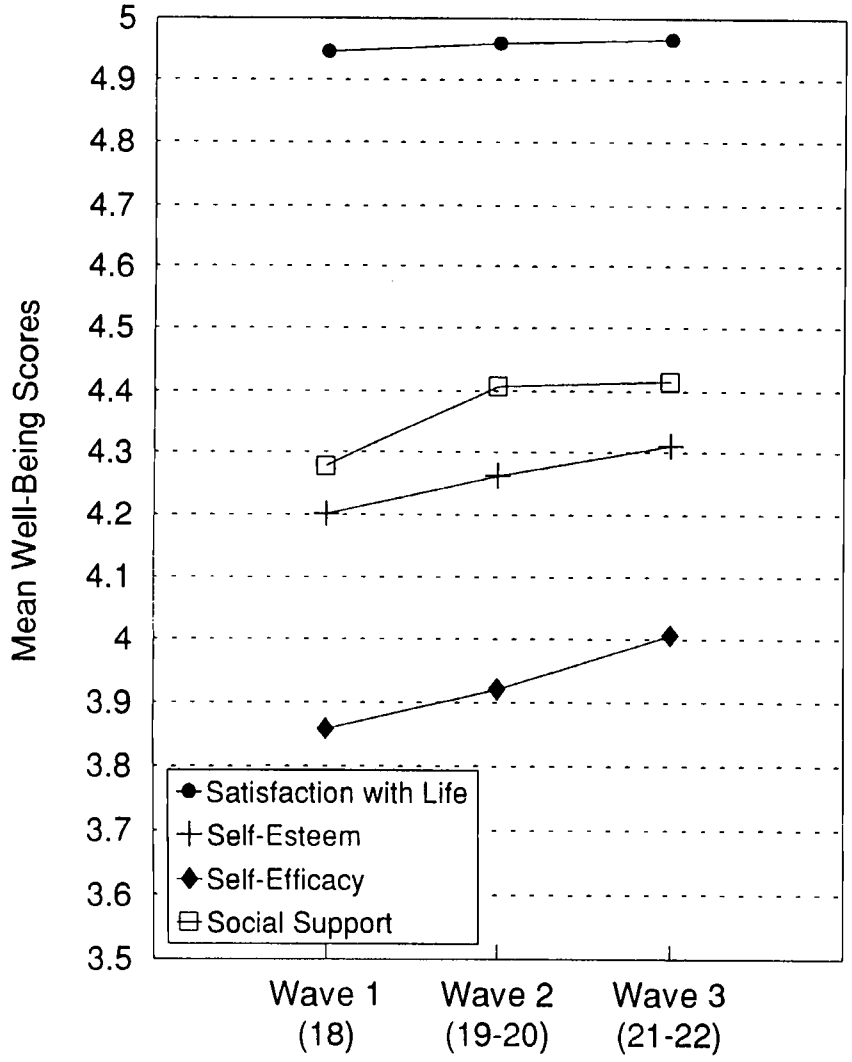
b. These age-change coefficients represent deviations from the total sample coefficients (centered around zero). Significant positive and negative linear coefficients refer to significantly more positive and negative linear age-related change, respectively, compared to the total sample; significant positive and negative quadratic coefficients refer to significantly more positive and negative quadratic effects, respectively, compared to total sample. Non-significant coefficients (i.e., those not significantly different from the total sample coefficient) indicated by "--".

FIGURES

Figure 1.
Monitoring the Future Longitudinal Panels by Cohort: Senior Year Classes 1976-1992

Class Year	Year of Data Collection																		
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
76	BY	FU1	FU1	FU2	FU2															
77		BY	FU1	FU1	FU2	FU2														
78			BY	FU1	FU1	FU2	FU2													
79				BY	FU1	FU1	FU2	FU2												
80					BY	FU1	FU1	FU2	FU2											
81						BY	FU1	FU1	FU2	FU2										
82							BY	FU1	FU1	FU2	FU2									
83								BY	FU1	FU1	FU2	FU2								
84									BY	FU1	FU1	FU2	FU2							
85										BY	FU1	FU1	FU2	FU2						
86											BY	FU1	FU1	FU2	FU2					
87												BY	FU1	FU1	FU2	FU2				
88													BY	FU1	FU1	FU2	FU2			
89														BY	FU1	FU1	FU2	FU2		
90															BY	FU1	FU1	FU2	FU2	
91																BY	FU1	FU1	FU2	FU2
92																	BY	FU1	FU1	FU2

Figure 2.
Change in Well-Being during the Transition to Young Adulthood: Total Sample



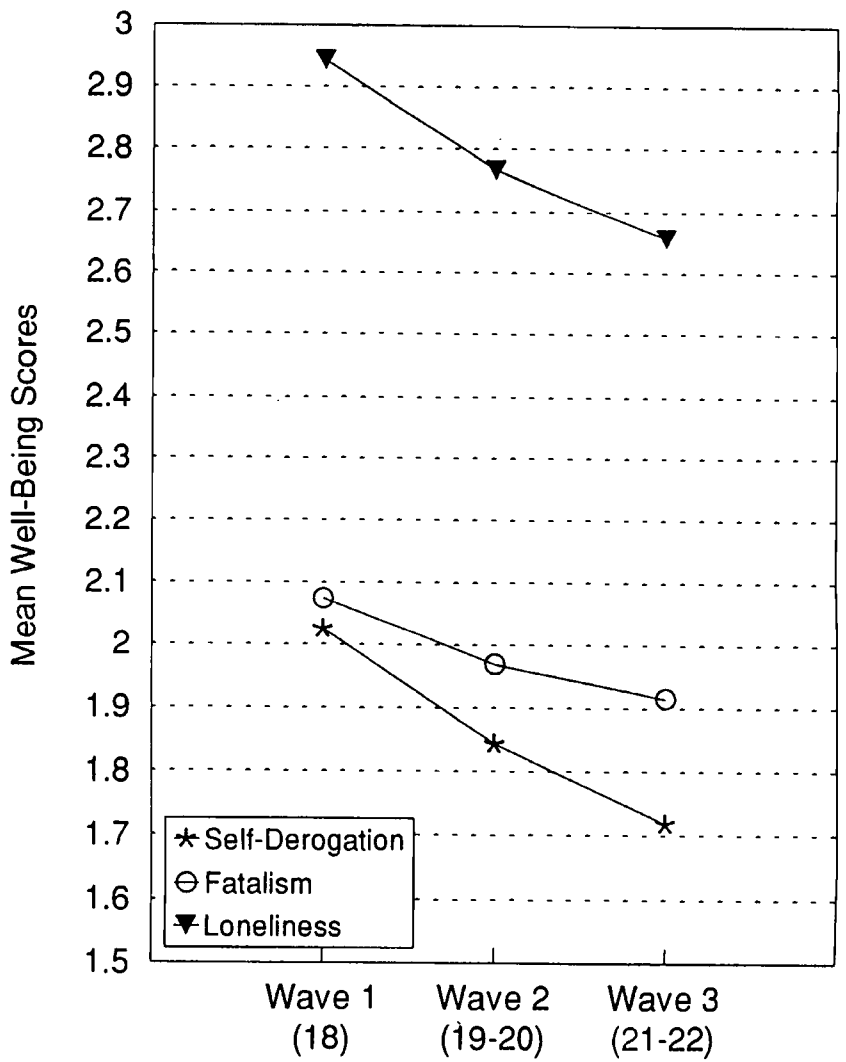


Figure 3.
Change in Substance Use during the Transition to Young Adulthood: Total Sample

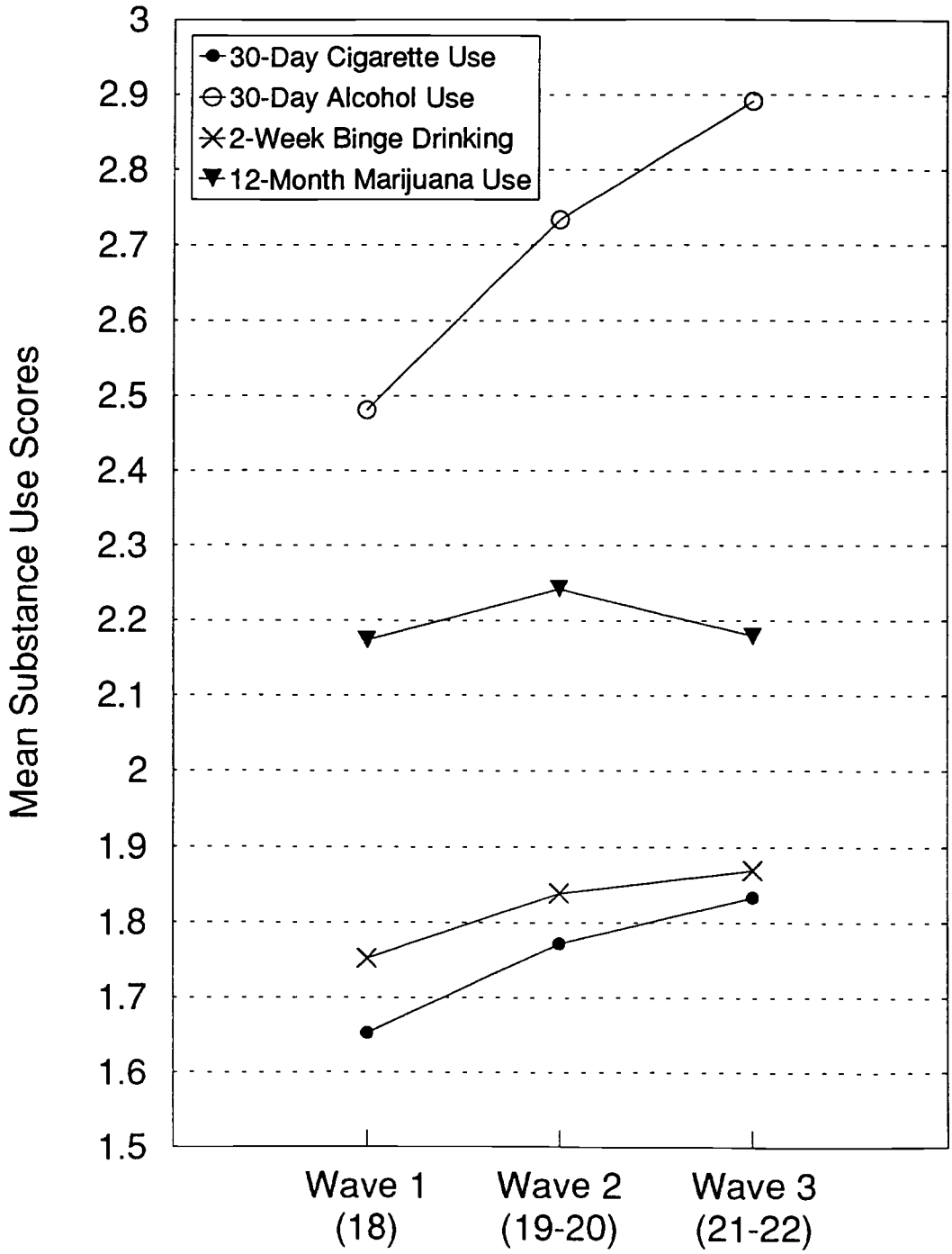
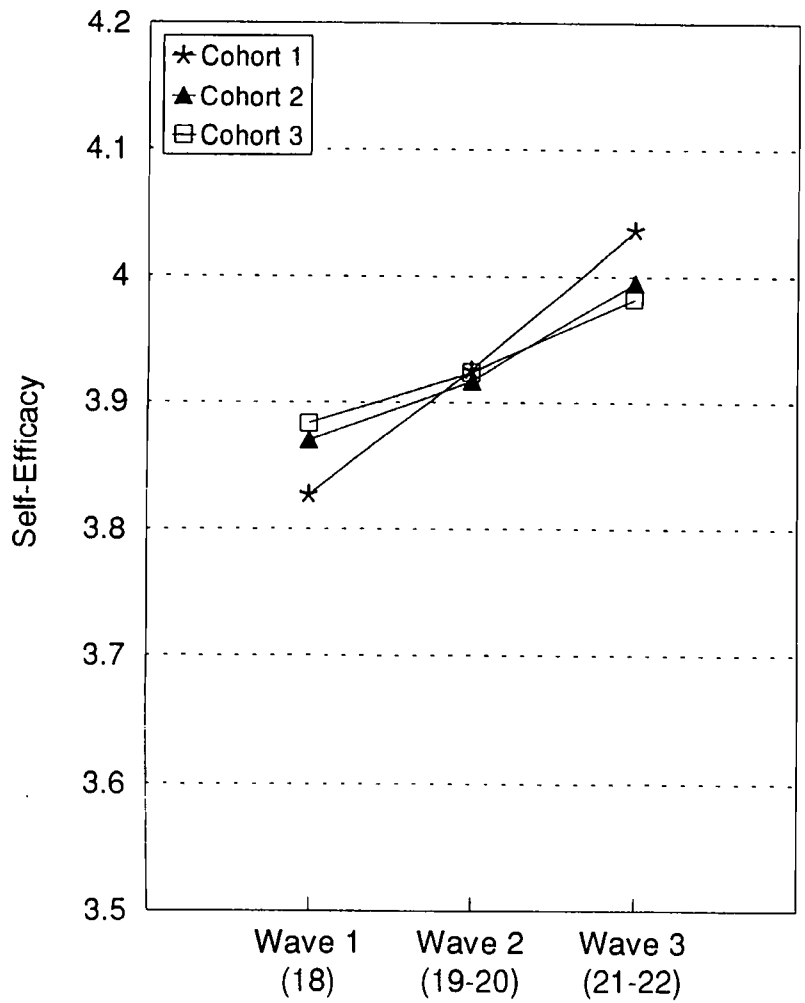


Figure 4.
Cohort Differences in Well-Being during the Transition to Young Adulthood: Self-Efficacy and Fatalism



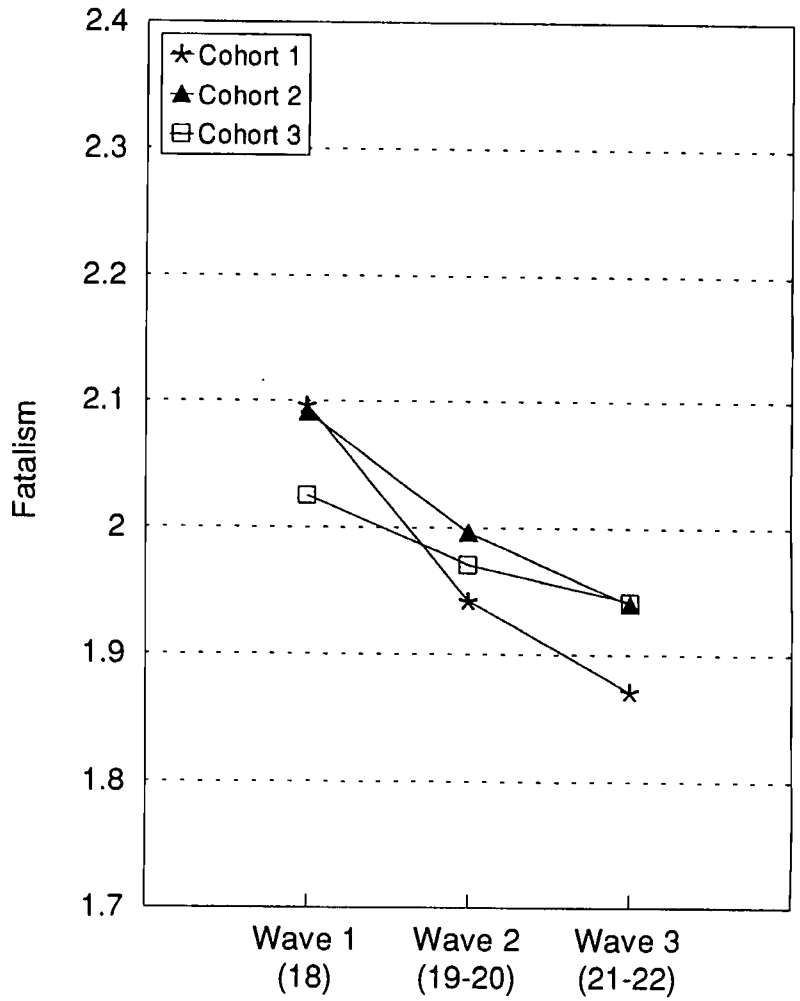
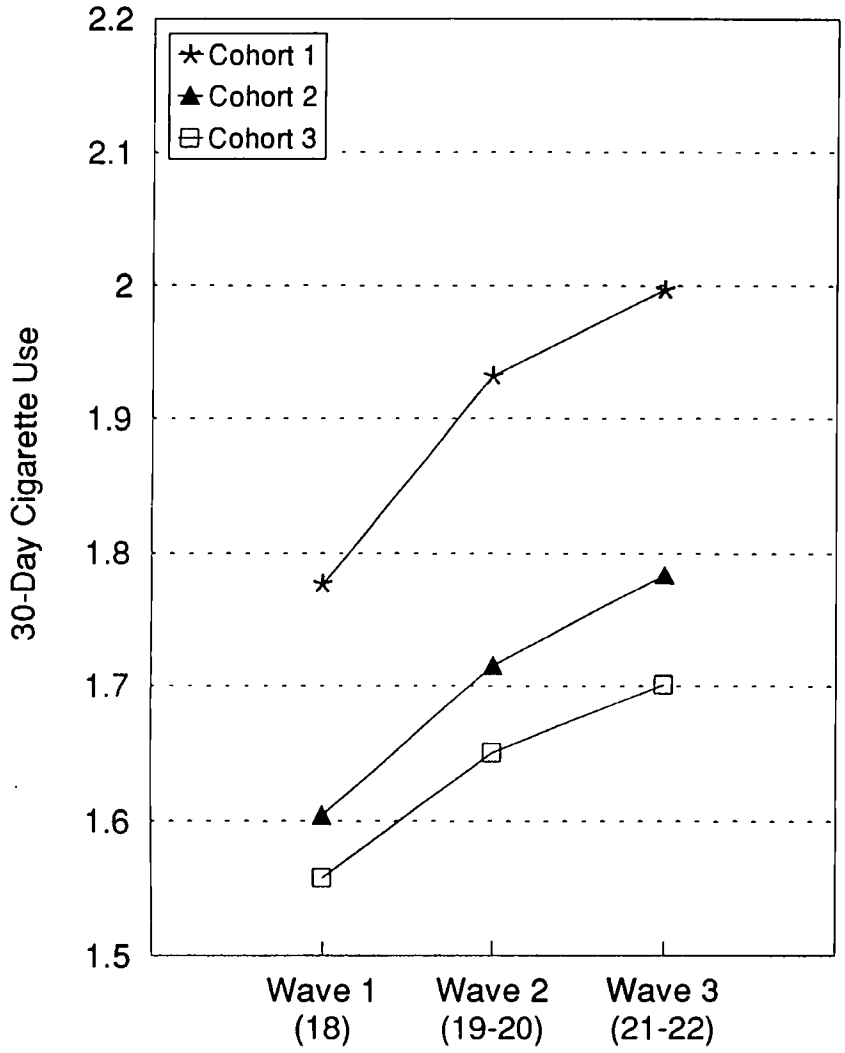


Figure 5.
Cohort Differences in Substance Use during the Transition to Young Adulthood: 30-Day Cigarette Use and 12-Month Marijuana Use



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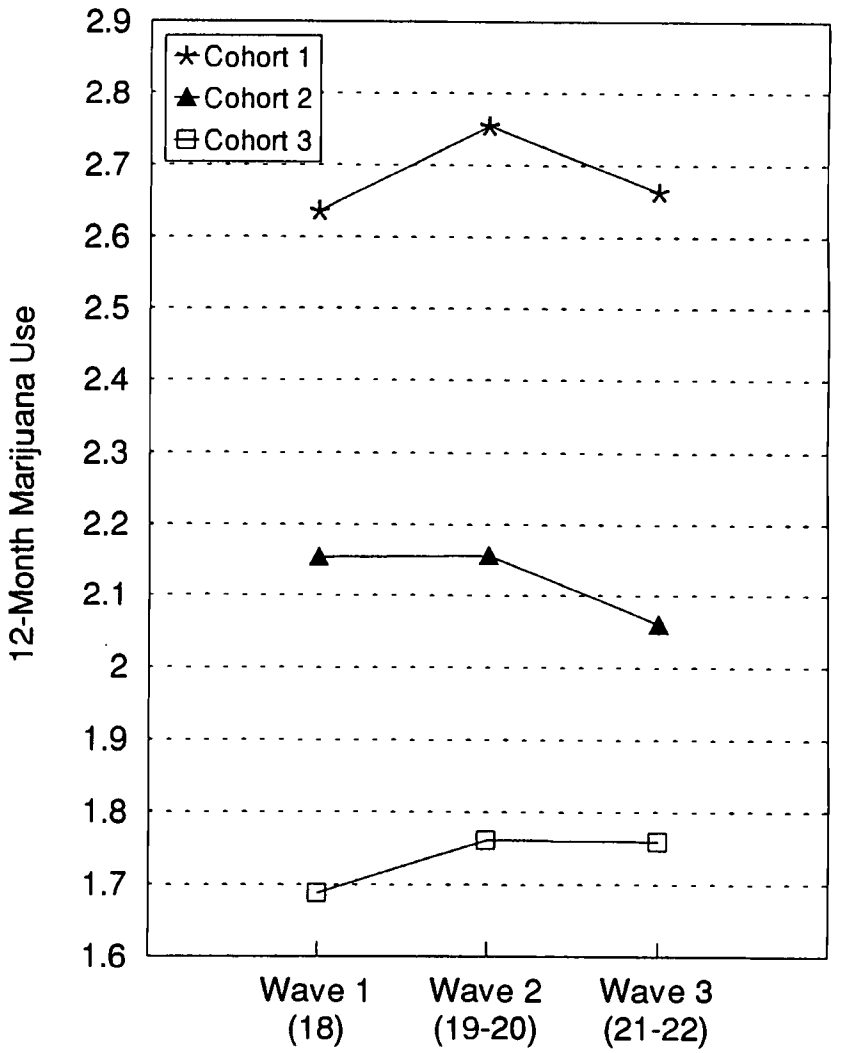

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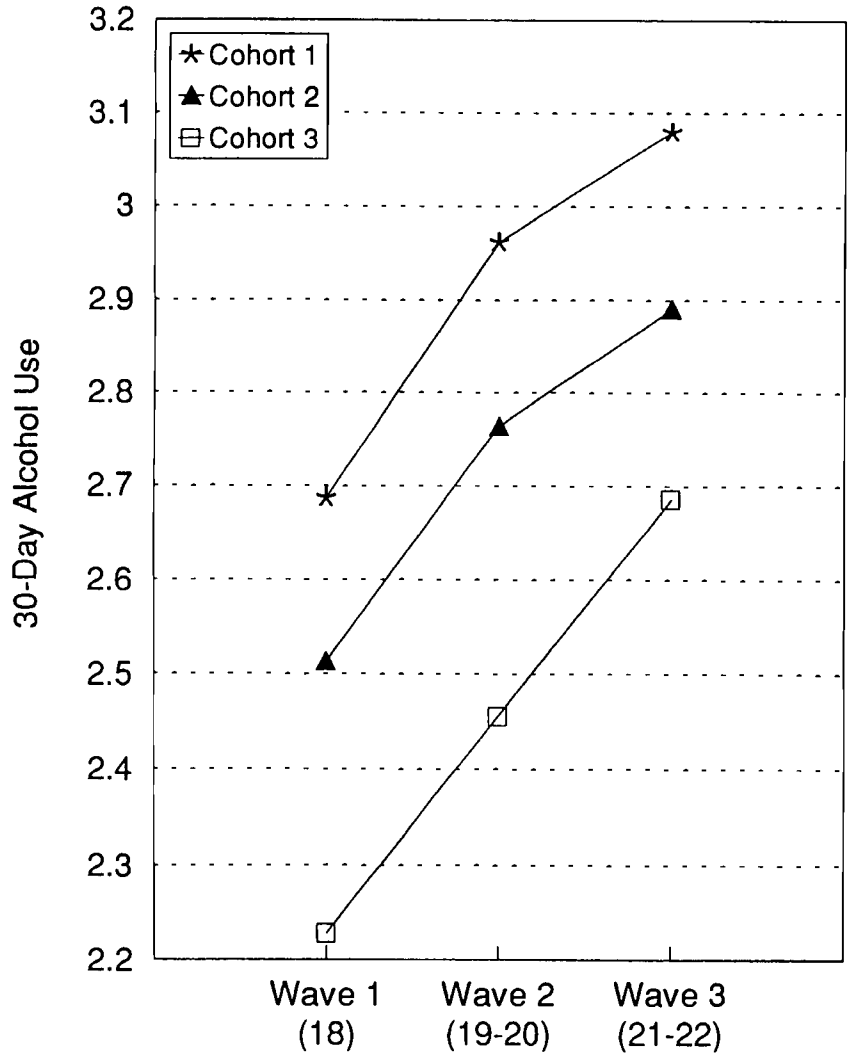
Figure 6.
Cohort Differences in Substance Use during the Transition to Young Adulthood: 30-Day Alcohol Use and 2-Week Binge Drinking



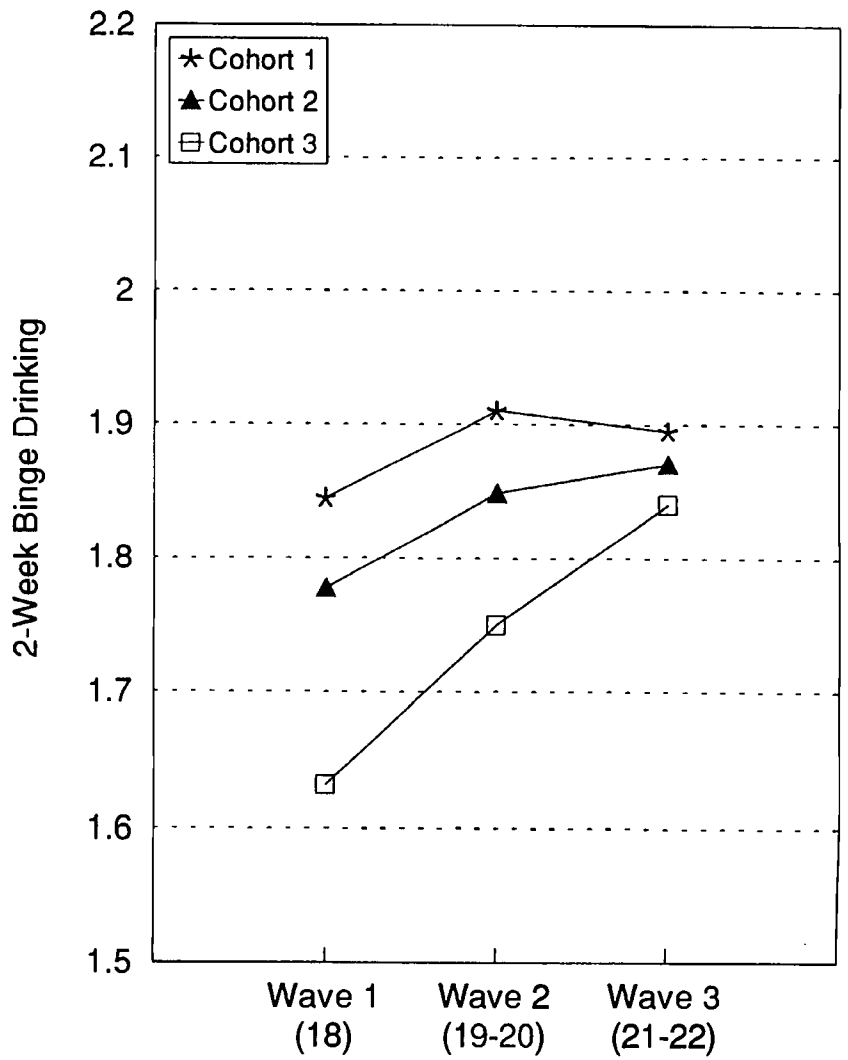
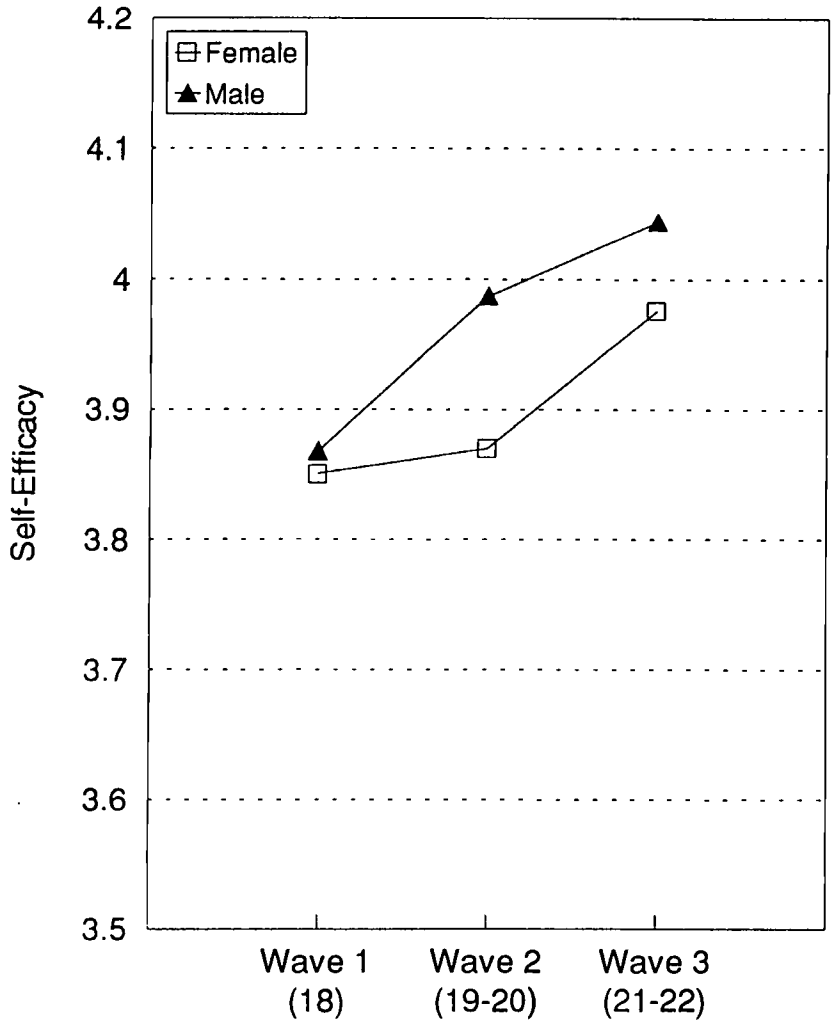


Figure 7.
Gender Differences in Well-Being during the Transition to Young Adulthood: Self-Efficacy and Social Support



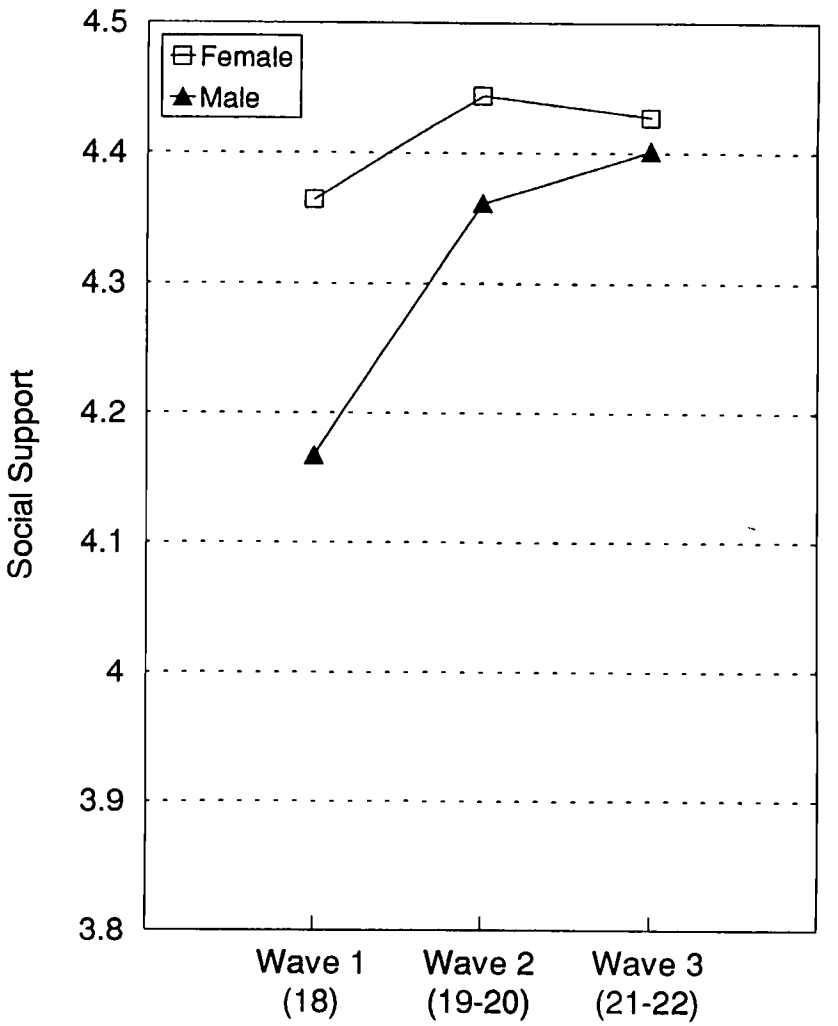
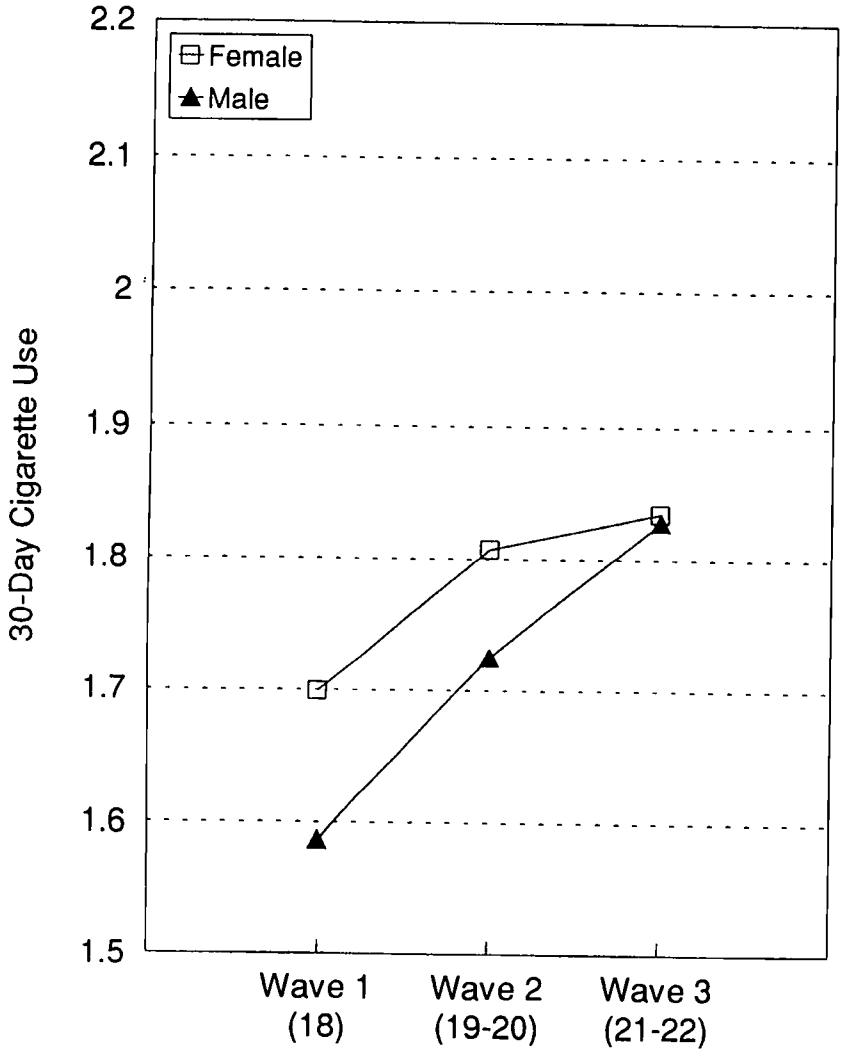


Figure 8.
Gender Differences in Substance Use during the Transition to Young Adulthood: 30-Day Cigarette Use and 12-Month Marijuana Use



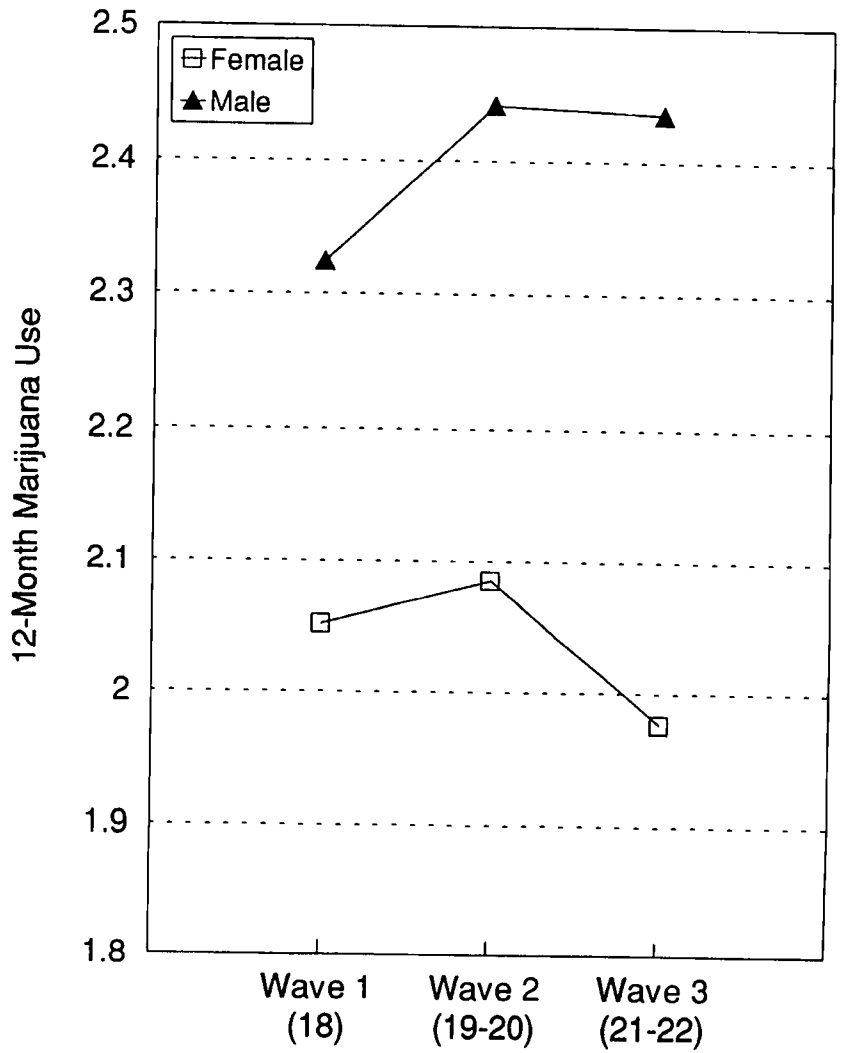
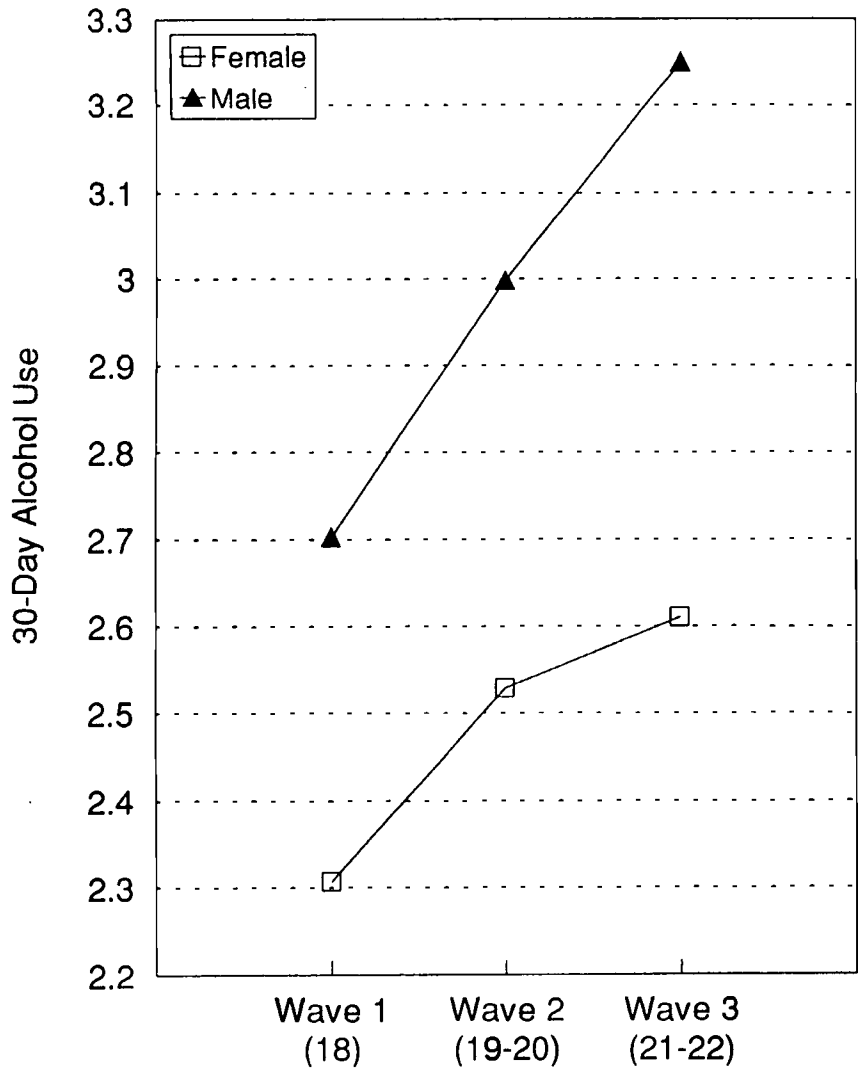


Figure 9.
Gender Differences in Substance Use during the Transition to Young Adulthood: 30-Day Alcohol Use and 2-Week Binge Drinking



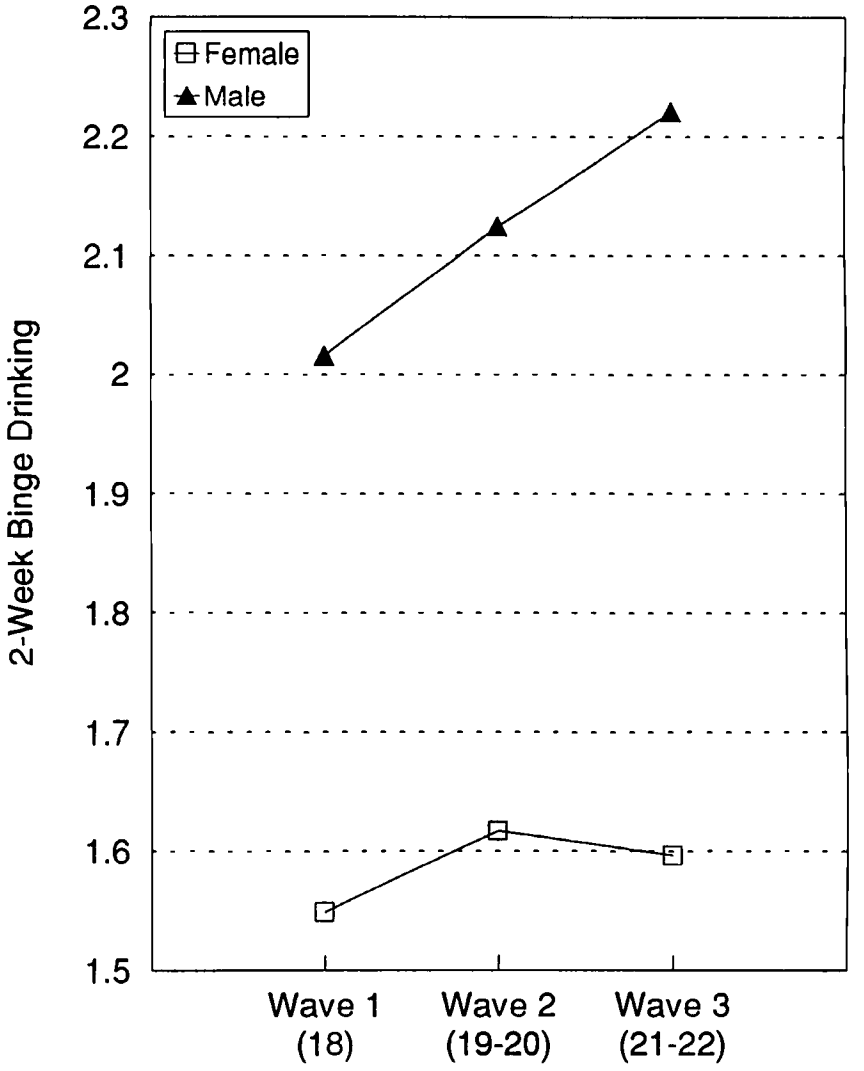


Figure 10.
Life Path Differences in Well-Being during the Transition to Young Adulthood: Satisfaction with Life

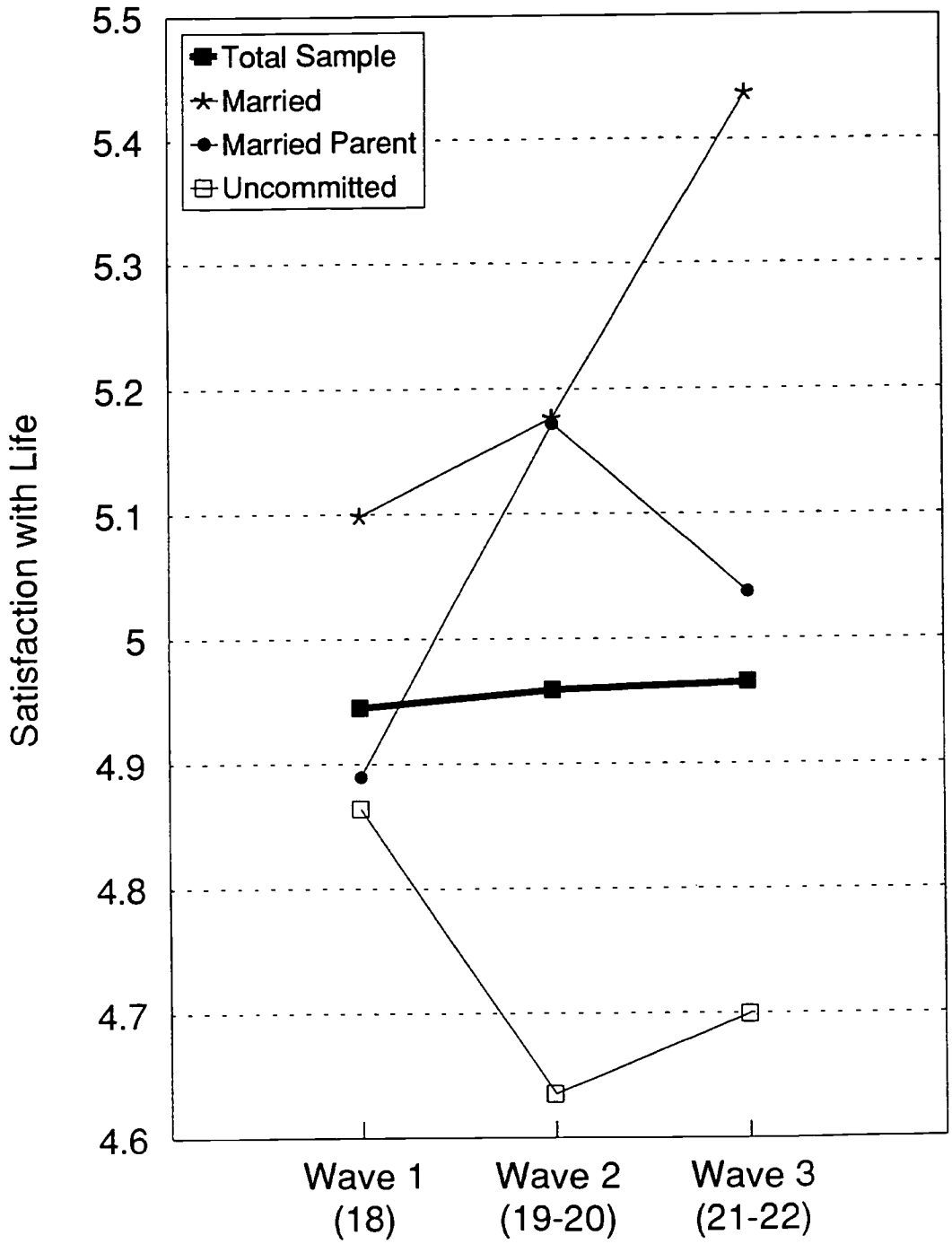


Figure 11.
Life Path Differences in Well-Being during the Transition to Young Adulthood: Loneliness

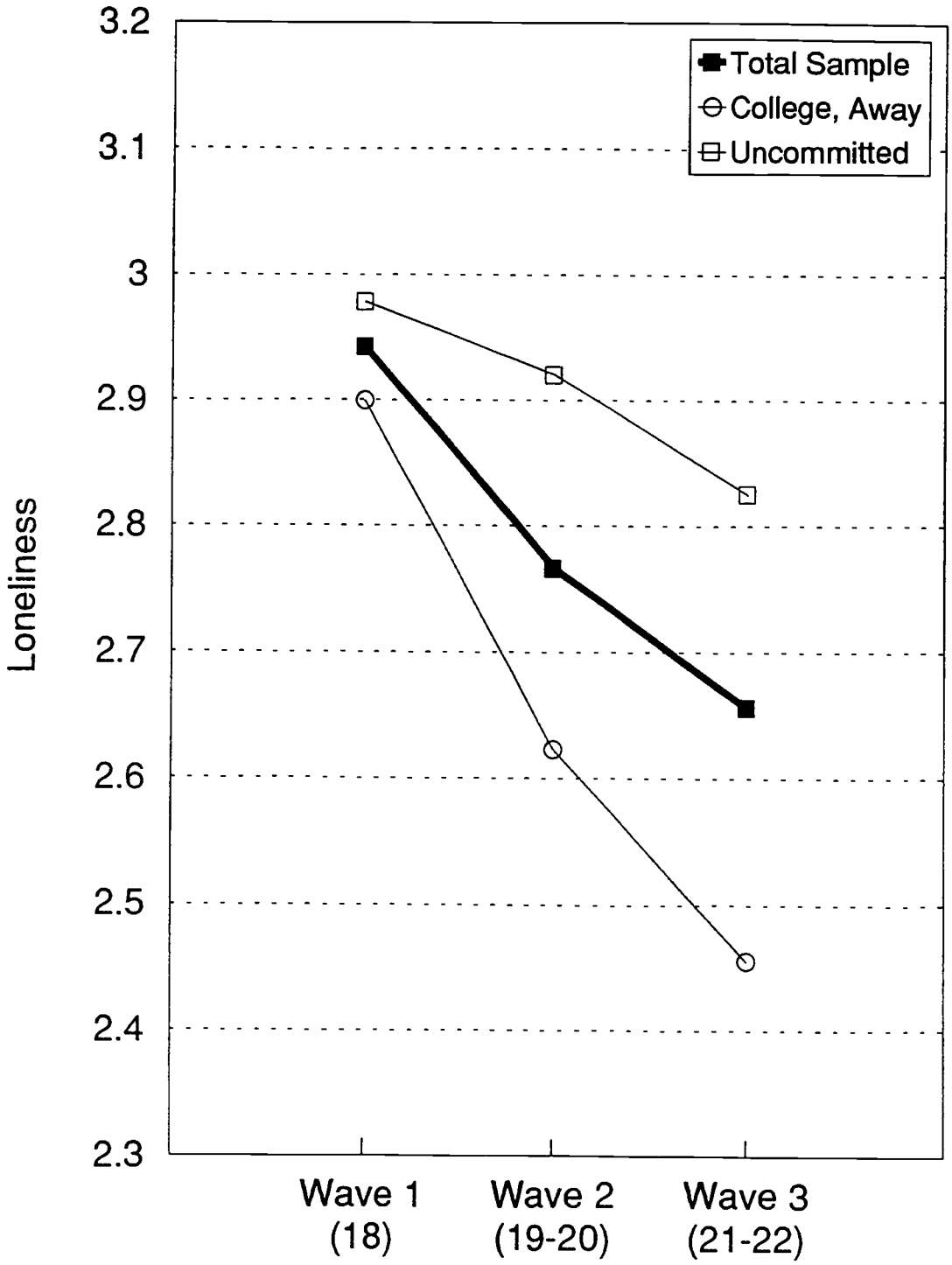


Figure 12.
Life Path Differences in Substance Use during the Transition to Young Adulthood: 30-Day Cigarette Use

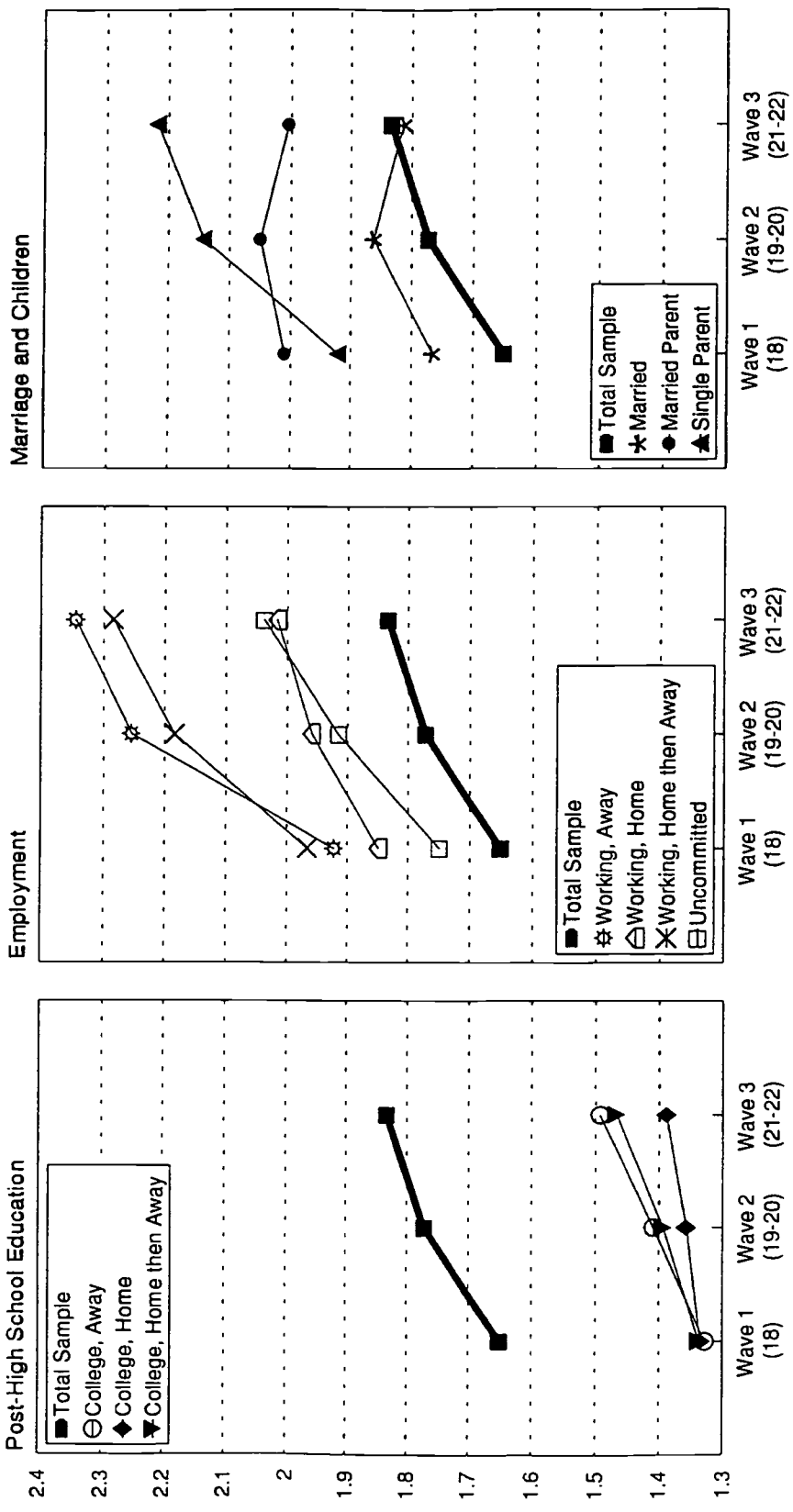


Figure 13.
Life Path Differences in Substance Use during the Transition to Young Adulthood: 30-Day Alcohol Use

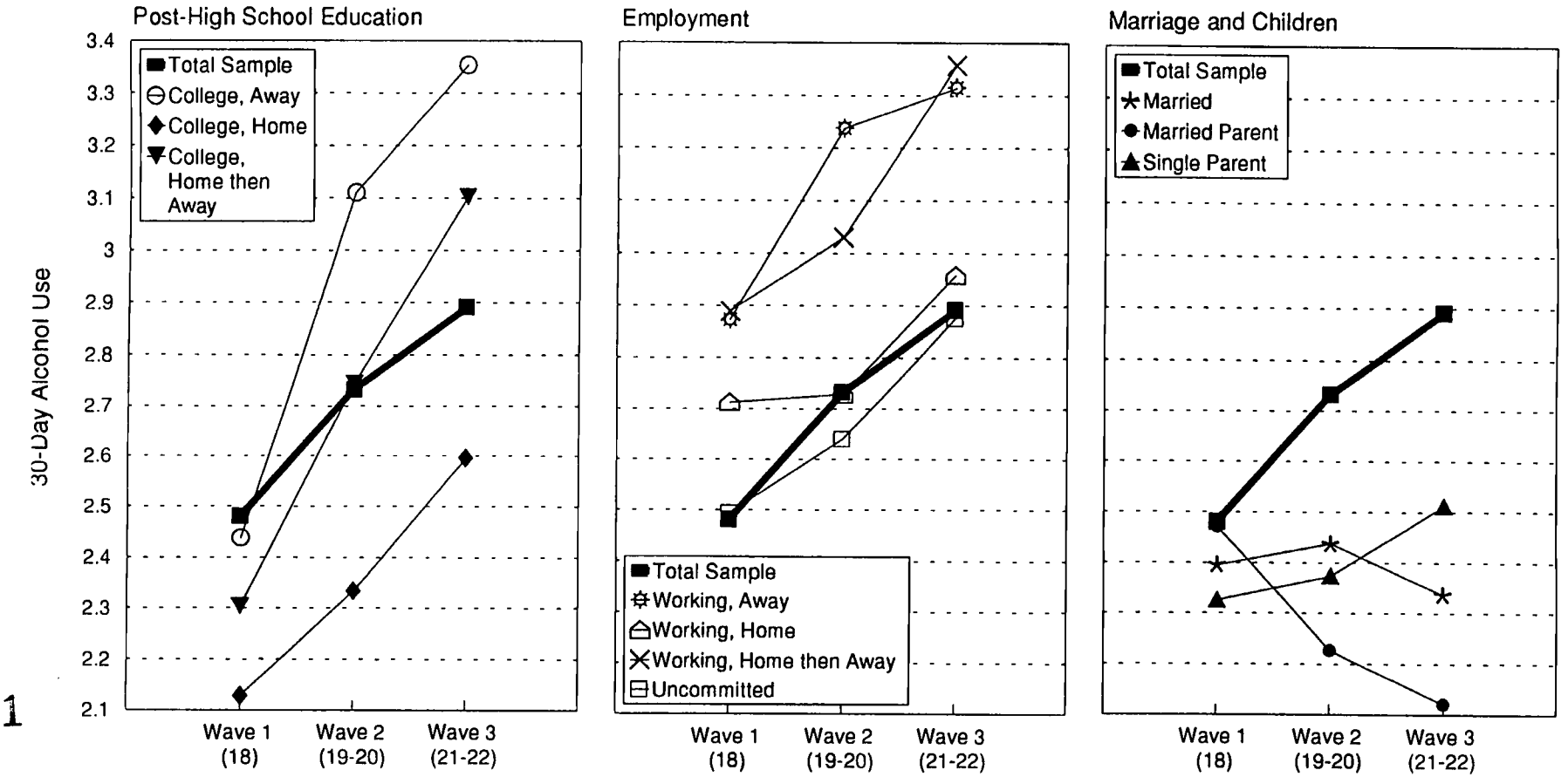


Figure 14.
Life Path Differences in Substance Use during the Transition to Young Adulthood: 2-Week Binge Drinking

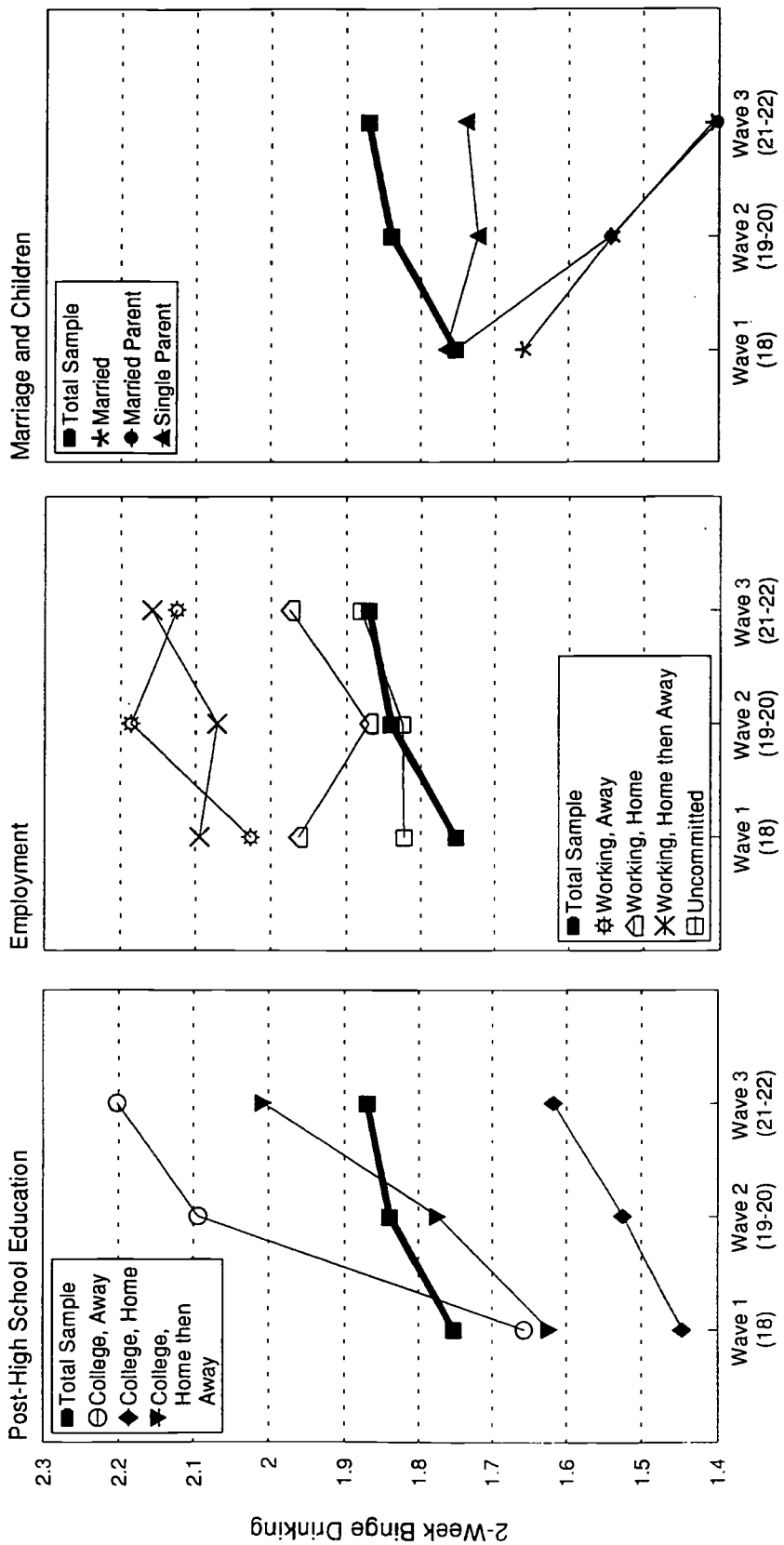
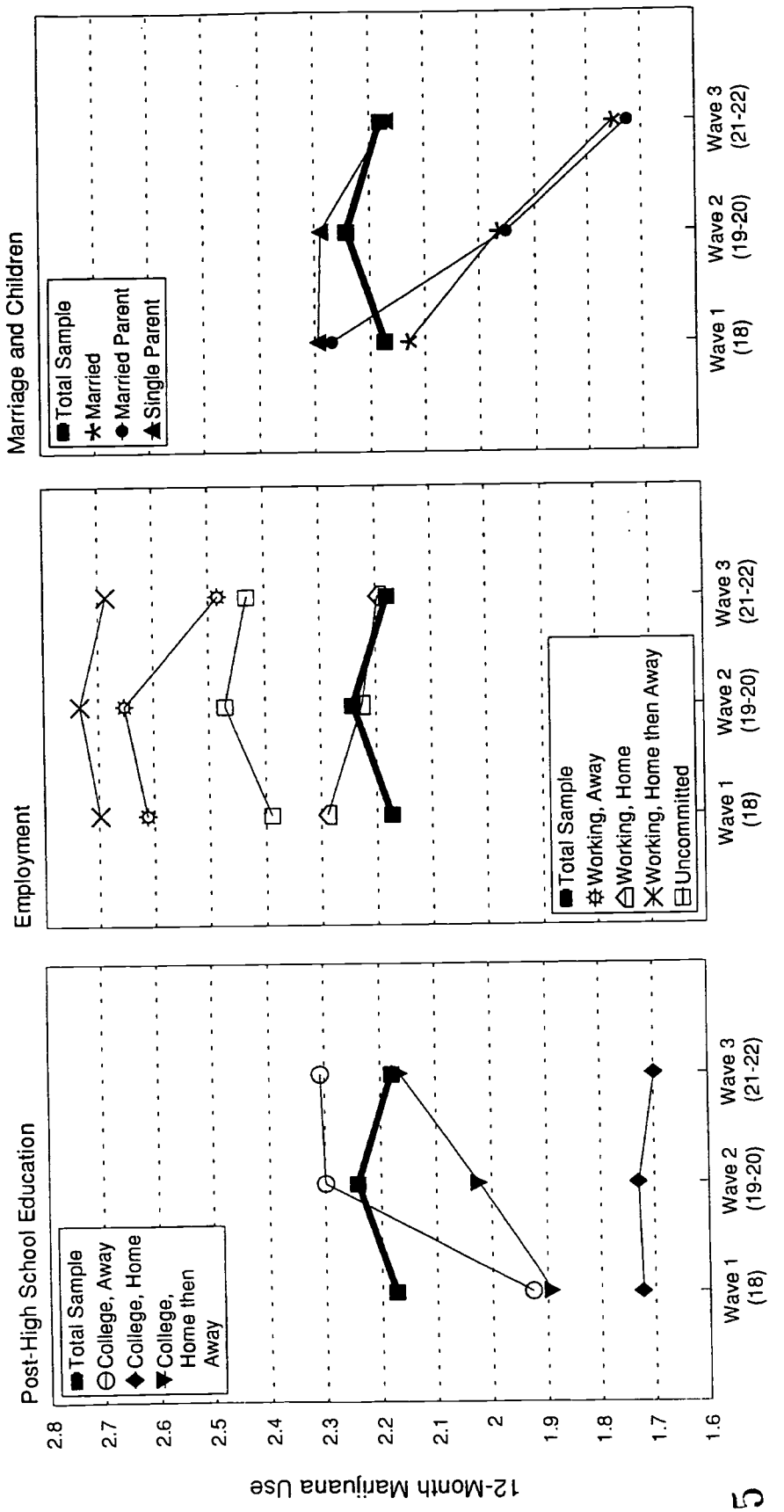


Figure 15.
Life Path Differences in Substance Use during the Transition to Young Adulthood: 12-Month Marijuana Use



APPENDIX

Table A-1

Table A-1. Summary of Repeated Measures MANOVAs (F values): Impact of Cohort, Gender, Life Path, and Age on Well-Being during the Transition to Young Adulthood.

	Effect df	Life Sat.	Self-Esteem	Self-Derogation	Self-Efficacy	Fatalism
Between-Subjects Effects[a]						
Cohort (C)	2					
Gender (G)	1		34.28***	10.97***	8.56**	
Life Path (P)	10	6.37***	3.19***	8.86***	8.76***	21.98***
C*G	2					
C*P	20					
G*P	10					
C*G*P	20					
Within-Subjects Effects[b]						
Age (A)	2		36.39***	125.02***	34.49***	36.88***
linear	1		72.51***	249.89***	65.55***	71.21***
quadratic	1					
C*A	4				2.61*	3.02*
linear	2				5.20**	5.95**
quadratic	2					
G*A	2				4.96**	
linear	1					
quadratic	1				9.49**	
P*A	20	2.35***				
linear	10	2.59**				
quadratic	10	2.11*				
C*G*A	4			2.81*		
linear	2					
quadratic	2			3.45*		
C*P*A	40		1.41*	1.32+		
linear	20		2.02**	1.58*		
quadratic	20					
G*P*A	20					
linear	10					
quadratic	10					
C*G*P*A	40					
linear	20					
quadratic	20					

a. minimum error df for between-subjects effects: 3282.
b. minimum error df for within-subjects effects: 3281 for age effect and age by gender interaction, and 6564 for all other time interactions; 3282 for linear and quadratic tests.
*** = p<.001, ** = p<.01, * = p<.05, + = p<.10 (trend included only for overall age effects).

Table A-1. continued

	Effect df	Social Support	Lone-liness
Between-Subjects Effects[a]			
Cohort (C)	2		
Gender (G)	1	21.18***	6.73**
Life Path (P)	10		4.79***
C*G	2		5.85*
C*P	20		
G*P	10	2.13*	
C*G*P	20		
Within-Subjects Effects[b]			
Age (A)	2	35.63***	74.35***
linear	1	65.16***	148.07***
quadratic	1	9.29**	
C*A	4		
linear	2		
quadratic	2		
G*A	2	5.19**	
linear	1	3.25**	
quadratic	1		
P*A	20		1.59*
linear	10		2.73**
quadratic	10		
C*G*A	4		
linear	2		
quadratic	2		
C*P*A	40		
linear	20		
quadratic	20		
G*P*A	20		
linear	10		
quadratic	10		
C*G*P*A	40		
linear	20		
quadratic	20		

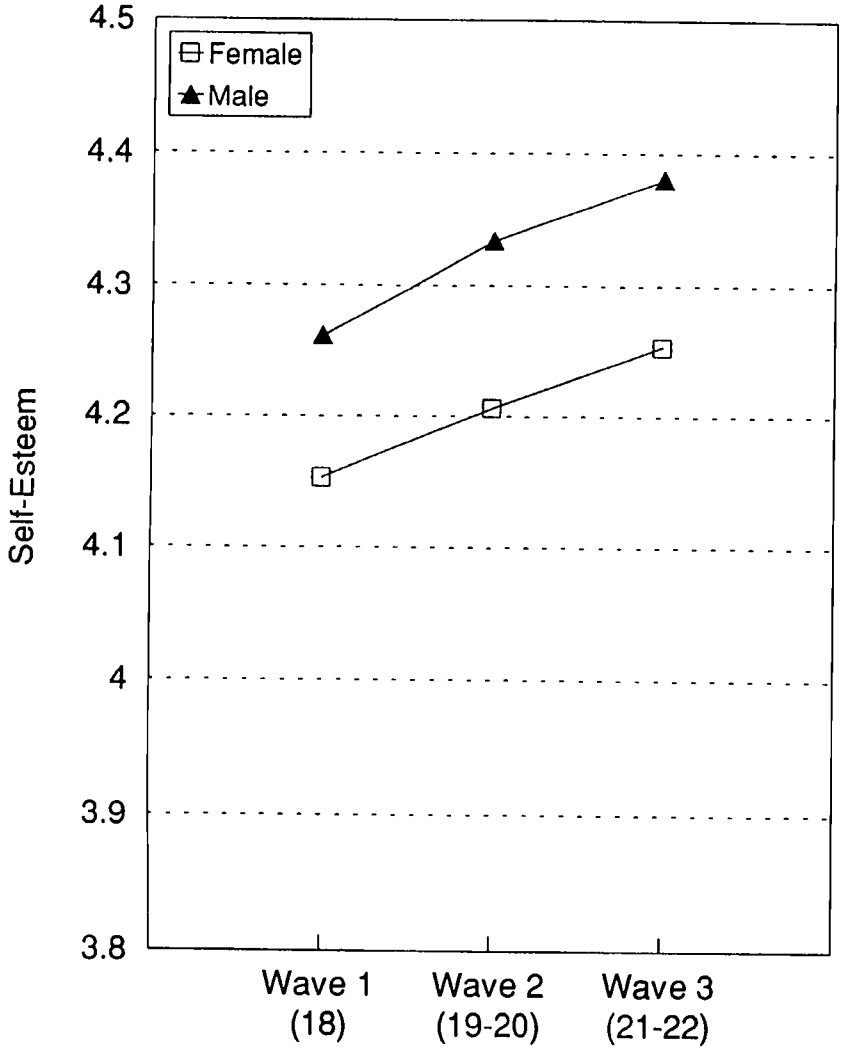
a. minimum error df for between-subjects effects: 3282.
b. minimum error df for within-subjects effects: 3281 for age effect and age by gender interaction, and 6564 for all other age interactions; 3282 for linear and quadratic tests.
*** = $p<.001$, ** = $p<.01$, * = $p<.05$.

Table A-2. Summary of Repeated Measures MANOVAs (F values): Effect of Cohort, Gender, Life Path, and Age on Substance Use during the Transition to Young Adulthood.

	Effect df	30 day Cigarettes	30 day Alcohol	Binge Drinking	12 month Marijuana
Between-Subjects Effects[a]					
Cohort (C)	2	50.21***	148.98***	29.73***	363.53***
Gender (G)	1	4.80*	430.81***	82.59***	90.91***
Life Path (P)	10	82.56***	52.81***	40.01***	31.75***
C*G	2			4.16*	10.18***
C*P	20	1.91**	1.93**	2.55***	2.45***
G*P	10	2.77**	7.43***	2.26*	2.22*
C*G*P	20				
Within-Subjects Effects[b]					
Age (A)	2	191.48***	351.54***	24.87***	15.85***
linear	1	359.62***	697.81***	49.67***	4.44*
quadratic	1	22.77***	5.93*		25.93***
C*A	4	4.28**	5.69***	4.10**	7.63***
linear	2	7.21***		3.10*	8.18***
quadratic	2		10.38***	4.91**	7.54***
G*A	2	14.70***	33.02***	14.27***	6.81***
linear	1	29.02***	63.28***	24.82***	12.81***
quadratic	1				
P*A	20	8.24***	41.83***	34.32***	19.39***
linear	10	14.16***	72.77***	59.62***	34.29***
quadratic	10	2.34**	12.48***	10.91***	5.92***
C*G*A	4				
linear	2				
quadratic	2				
C*P*A	40				
linear	20				
quadratic	20				
G*P*A	20	2.17***	1.72*		
linear	10	3.01***	1.85*		
quadratic	10				
C*G*P*A	40				
linear	20				
quadratic	20				

a. minimum error df for between-subjects effects: 18943.
b. minimum error df for within-subjects effects: 18942 for age effect and age by gender interaction, and 37882 for all other age interactions; 18943 for linear and quadratic tests.
*** = $p<.001$, ** = $p<.01$, * = $p<.05$.

Figure A-1.
Gender Differences in Well-Being during the Transition to Young Adulthood: Self-Esteem and Self-Derogation



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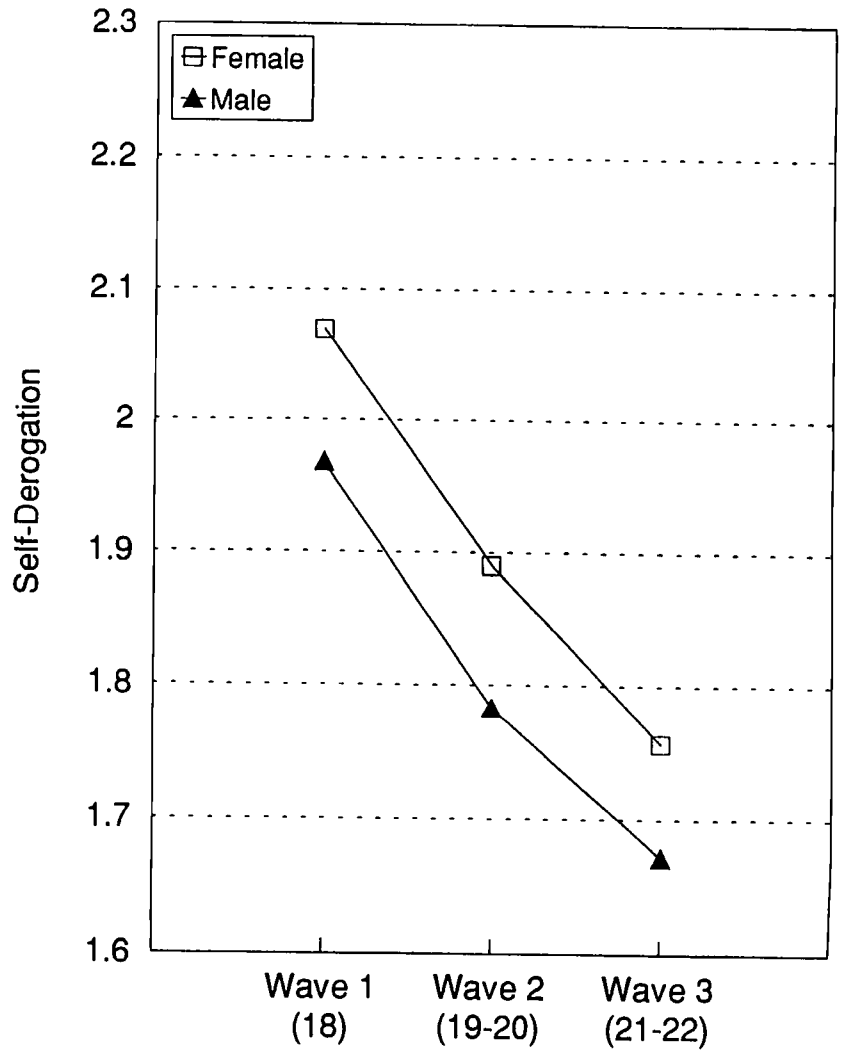

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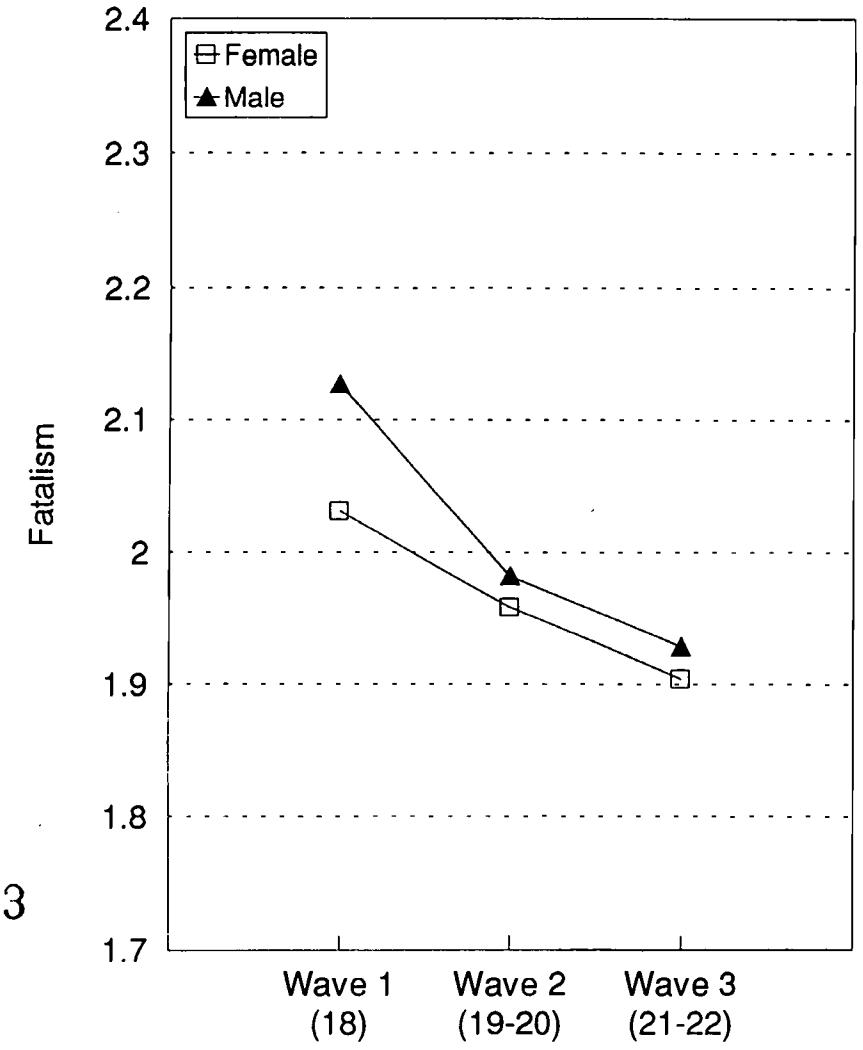
Figure A-2.
Gender Differences in Well-Being during the Transition to Young Adulthood: Fatalism and Loneliness



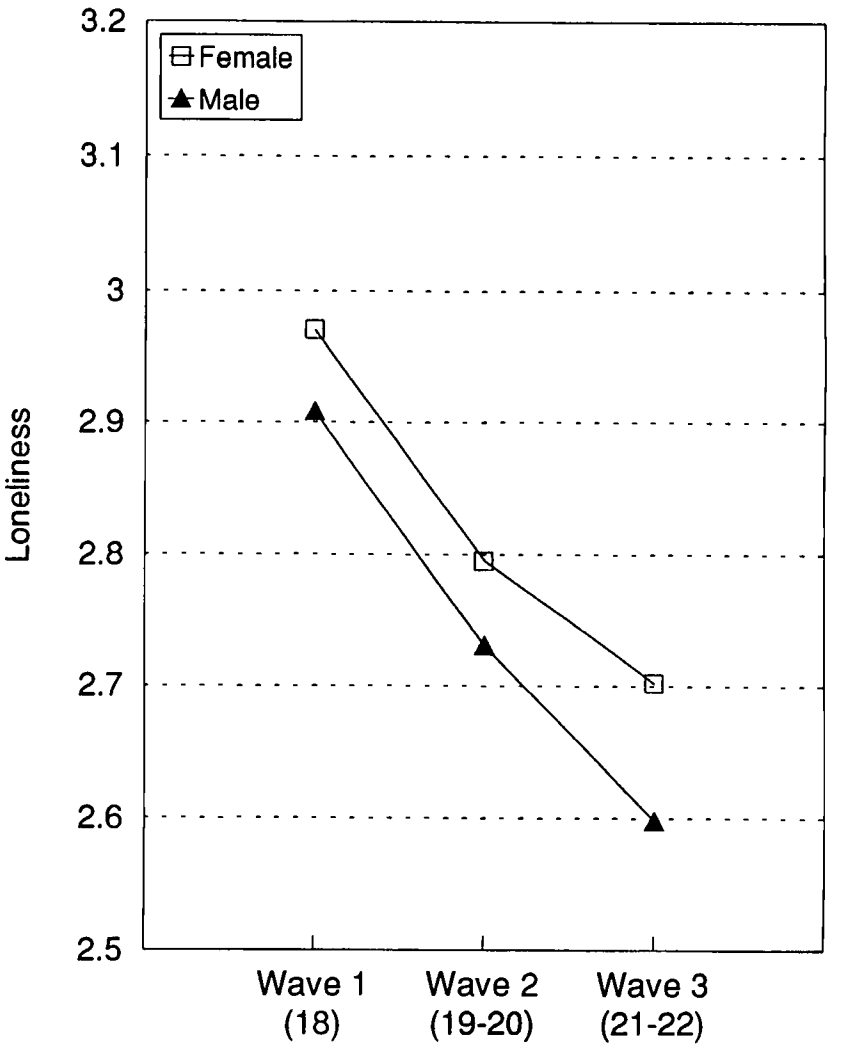


Figure A-3.
Life Path Differences in Well-Being during the Transition to Young Adulthood: Satisfaction with Life

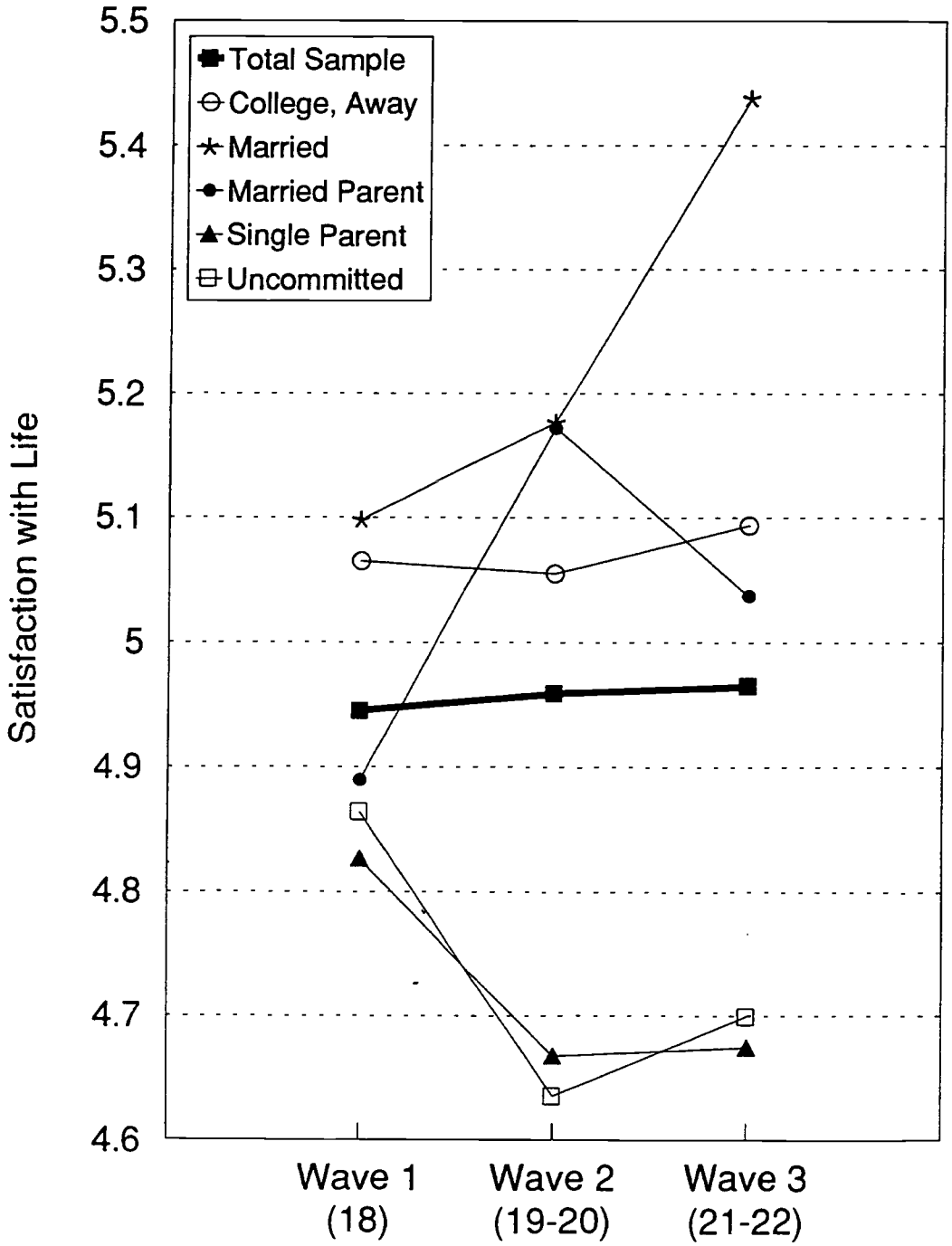
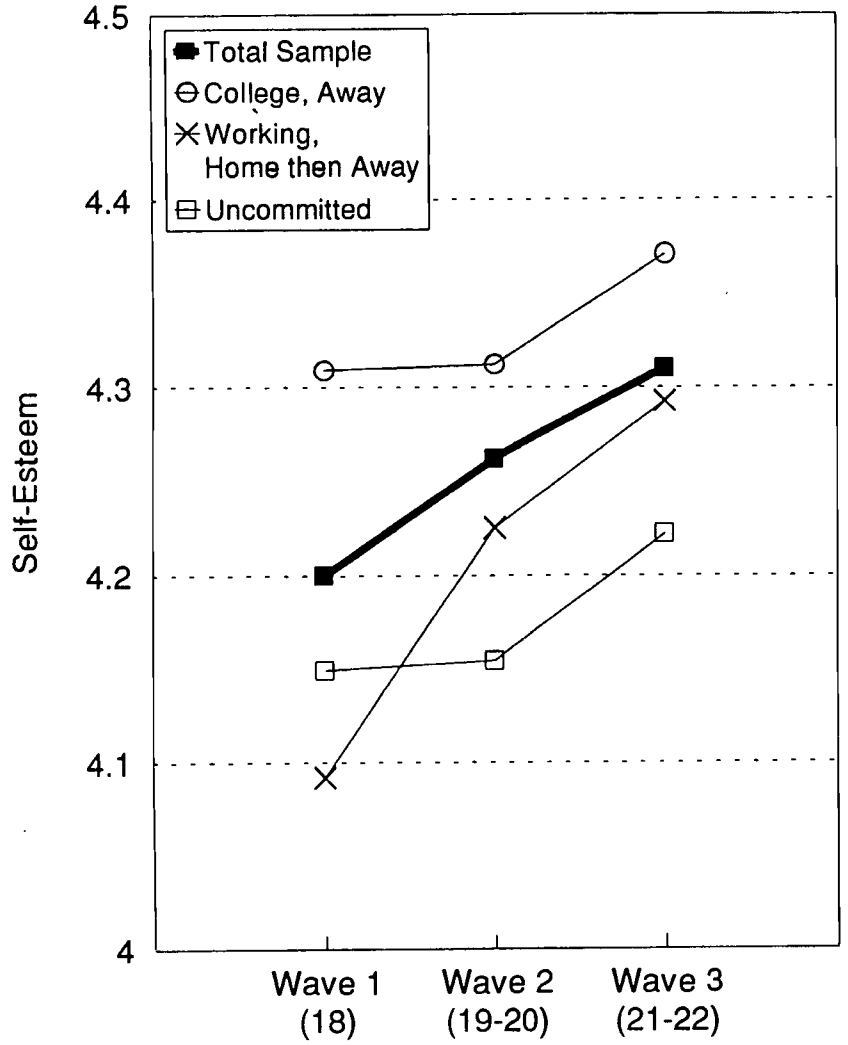


Figure A-4.
Life Path Differences in Well-Being during the Transition to Young Adulthood: Self-Esteem and Self-Derogation



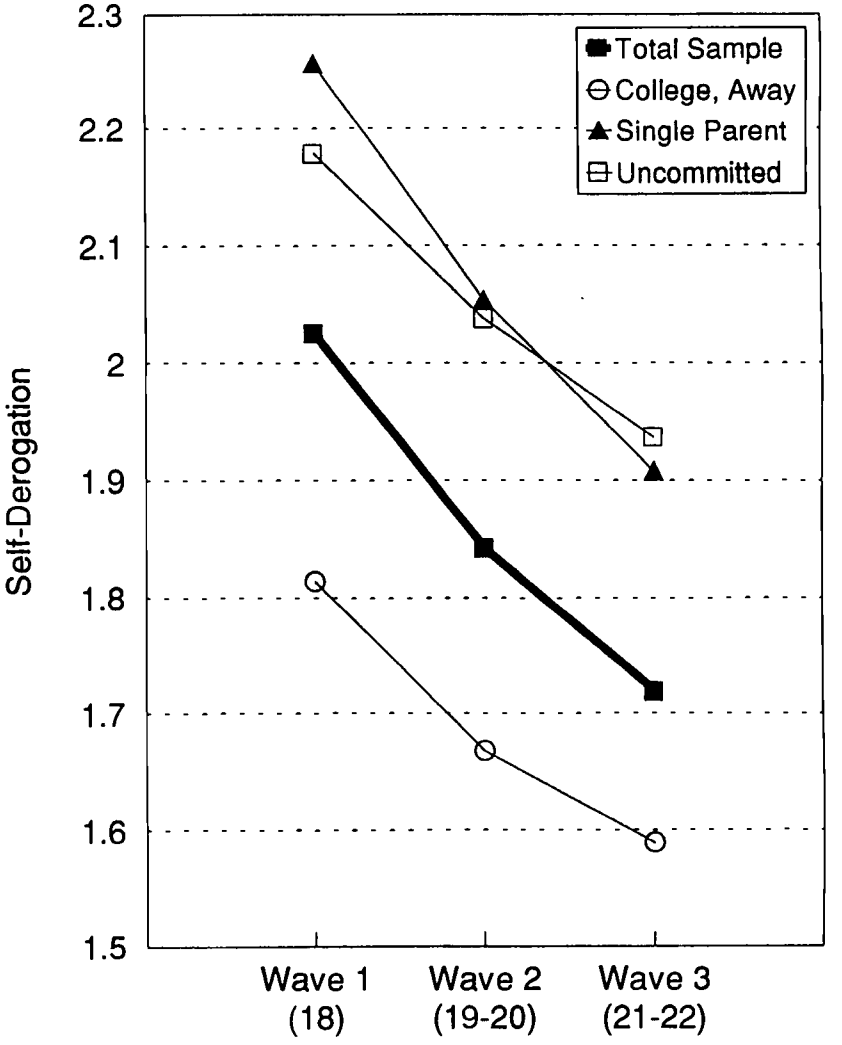
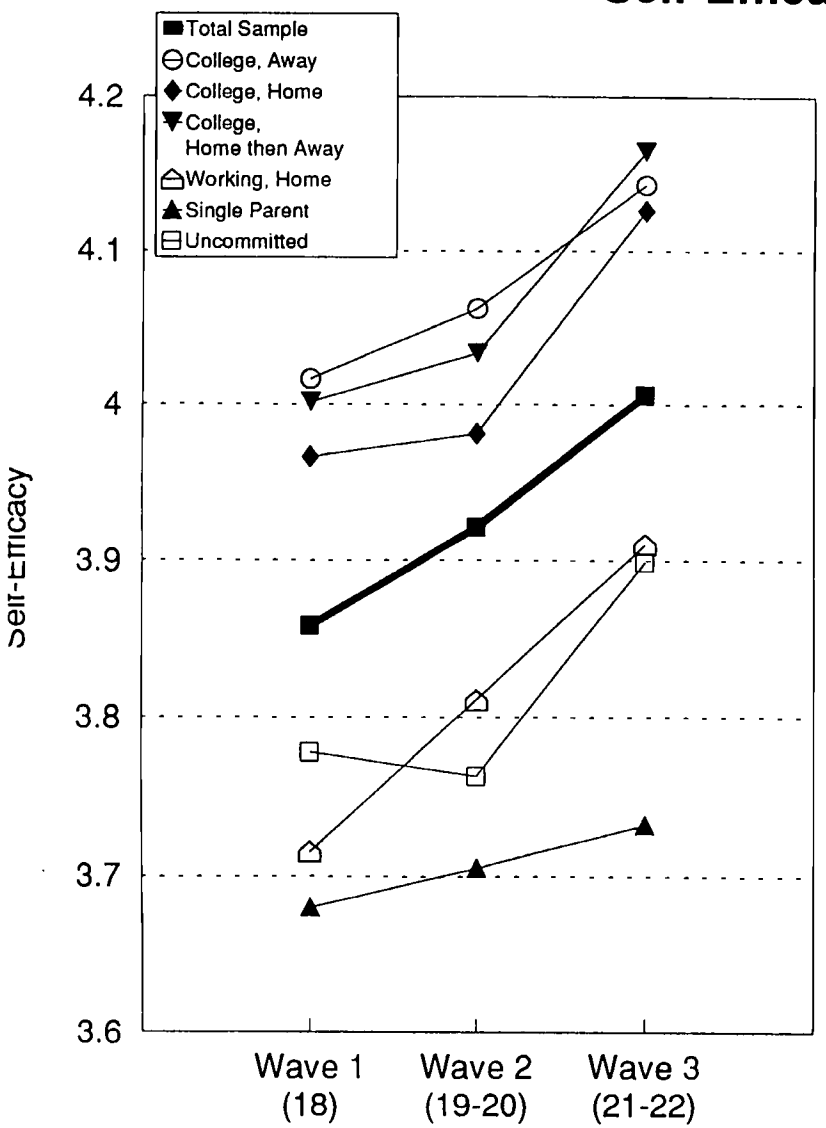


Figure A-5.
Life Path Differences in Well-Being during the Transition to Young Adulthood: Self-Efficacy and Fatalism



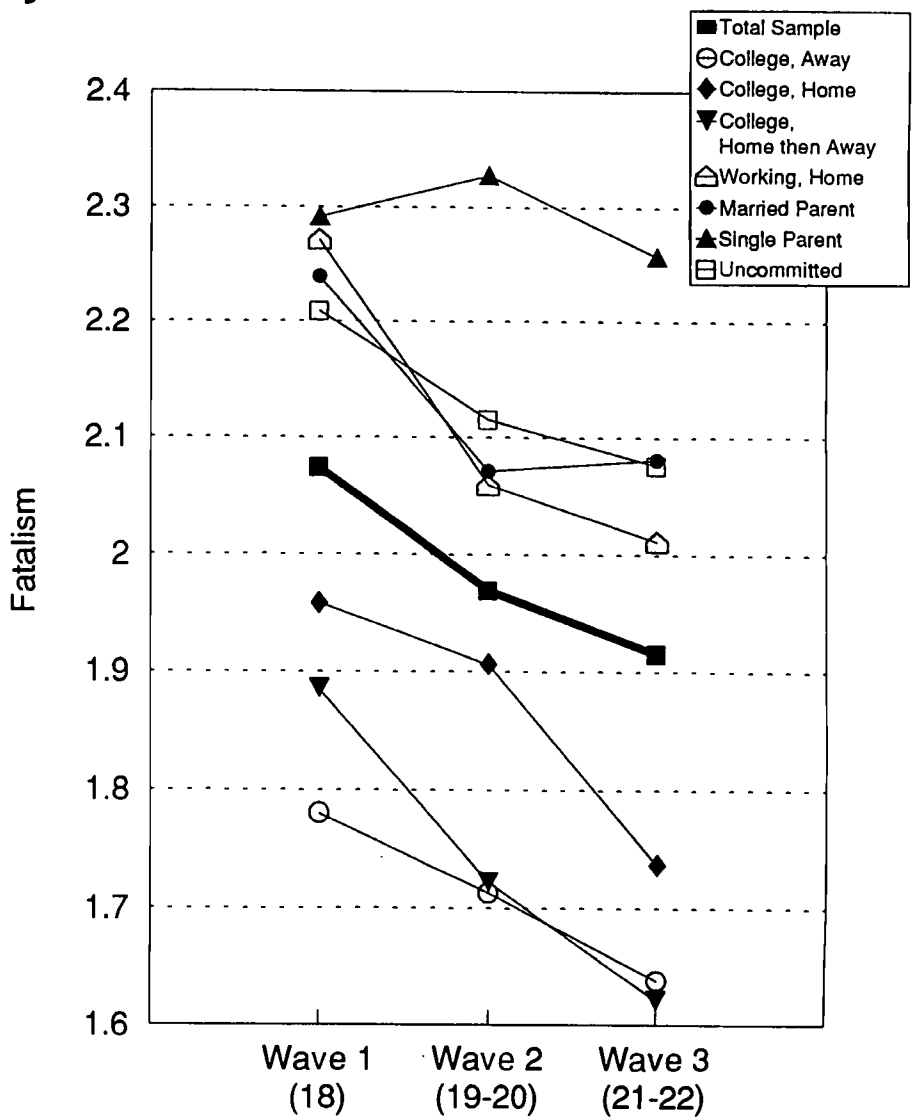
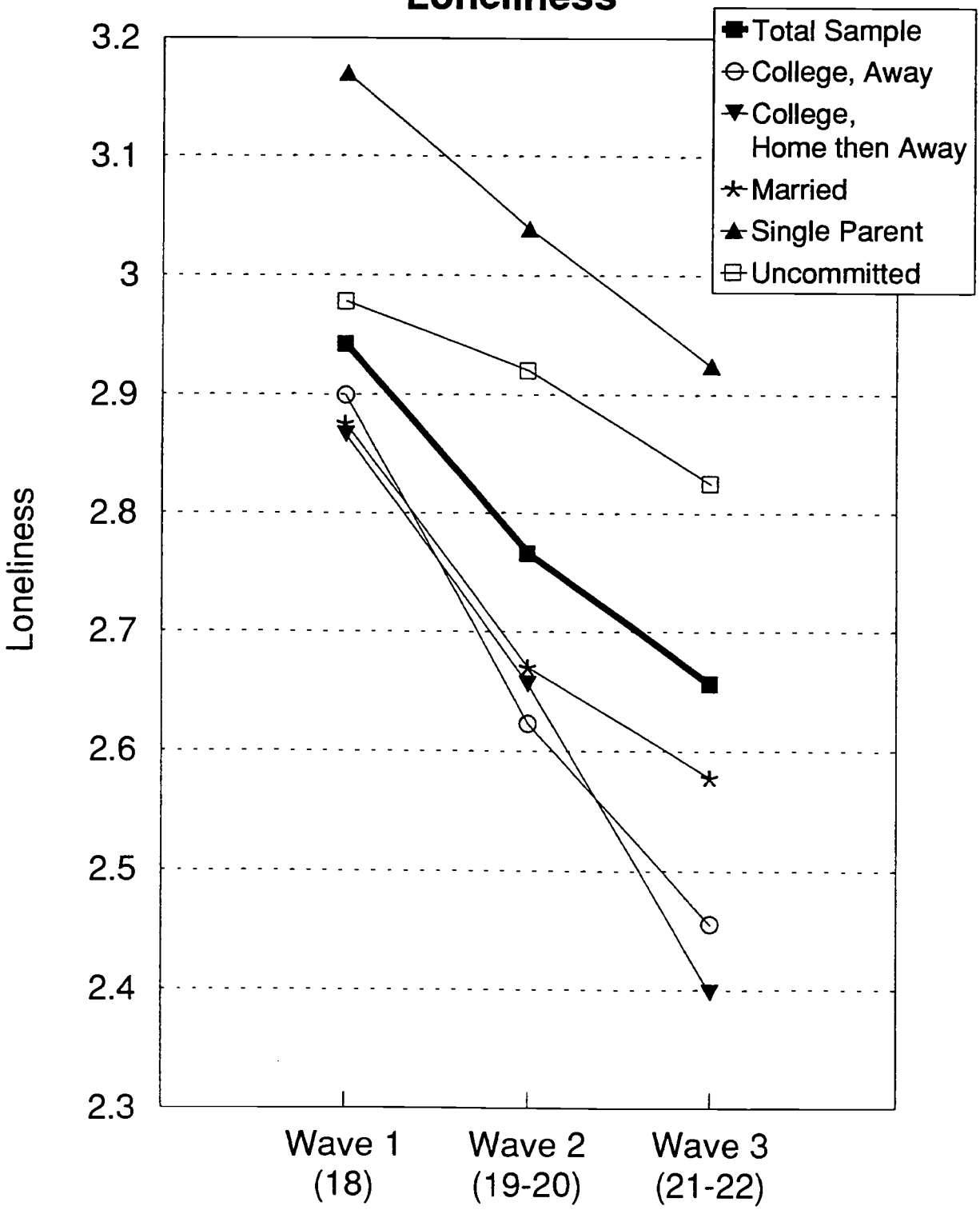


Figure A-6.
Life Path Differences in Well-Being during the Transition to Young Adulthood: Loneliness



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